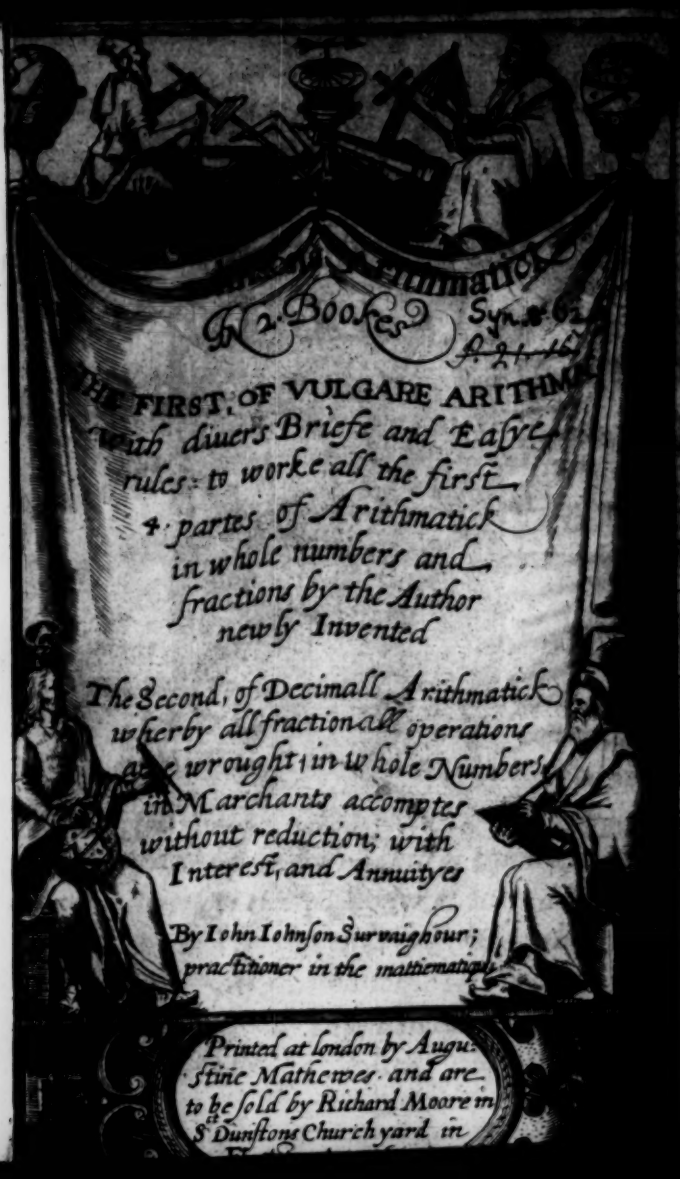
2. Bookes
THE FIRST, OF VULGARE ARITHM
with diuers Briefe and Easye
rules: to worke all the first
4. partes of Arithmatick
in whole numbers and
fractions by the Author
newly Invented
The Second, of Decimall Arithmatick
wherby all fraction all operations
are wrought, in whole Numbers
in Marchants accomptes
without reduction; with
Interest, and Annuityes
By Iohn Iohnson Surueighour;
practitioner in the mathematicall
Printed at london by Augu-
stine Mathewes and are
to be sold by Richard Moore in
St Dunstons Church yard in

2867 : 84

TO THE RIGHT HONOVRABLE SIR EDWARD BARKHAM, KNIGHT, Lord Maior of the City of *London*; and to the right Worſhipfull, the Shriefes and Aldermen his Brethren.

THe very Arts (Right Honorable and Worſhipfull) which were wont to beare the attributions of [honeſtæ & liberales] *ſeeme now to temporize, and to haue learned the new-found skill of equiuocation. For, howſoeuer the former of theſe denominations adhereth conſtantly vnto the Profeſſors of Mathematick Sciences, yet the other, which was once deriued* [a liberalitate] *and then intimated, that they were*

A *anciently*

anciently accuſtomed to performe liberall recompence to their louers and followers, hath now (to ſpare coſt) purchaſed a different etymologie [a libertate] *as properly accommodate to ſuch as are* [liberi] *free-borne, or (as our peculiar terme carrieth) Free-men. Which being ſo, and ſeeing that in this particular, as well as in many other of greater conſequence,* Tempora mutantur——*: I am thereby enforced to make vp the old verſe, adding* ——et nos mutamur in illis; *and to apply my long experience, together with tedious ſtudies beſtowed in this preſent art of numbers, to the vſe and behooſe of thoſe perſons, to whom by the generall appellation it properly belongeth, namely, to the ſtudious thereof in this honorable Citie. Which is the cauſe that I preſume (without farther ſelfe-praiſe, of what I haue brought more vſefull, more eaſie, or more certaine and delightfull in the operations, then hath been ſeene before) to preſent my Labours to your Honourable and Worſhipfull iudgements, to whom I owe of*

dutie,

dutie, whatſ oeuer can be of mee performed, to the furtherance of Art, and the honour of this noble Citie, and the worthie Companies therein.

Your Honours,

and Worſhips

deuoted in all humble reſpect,

IOHN IOHNSON,
Surtaigher.

THE EPISTLE TO THE READER.

GEntle and Curteous Reader; hauing for many yeares past ſpent my time both in reading, practiſing, and conferring with others in, and about the ſtudie of the Mathematicall Sciences, and through great paines and trauell, at the requeſt of diuers Worſhipfull Gentlemen, Merchants, and others of my very louing friends, haue at laſt collected and gathered together many excellent Rules and eaſie Abreuiations in the Science of Arithmatick, which at the entreaty, and by the meanes of the helpe of ſome of them, I haue at laſt made bold heere to preſent abroad vnto the worlds view, the firſt fruites of ſome idle houres ſtudie, the moſt part whereof I doe acknowledge to haue gotten by the practice and vſe of the moſt excellent Inſtrument, inuented by Maſter *William Pratt*, called, The Iewell of Arithma-

Arithmatick; in which I haue done the beſt of my Indeauours, not to hide that Tallent in the earth, which God hath beſtowed vpon me for the benefit of others, but rather to his great glory and prayſe, and for the benefit of my Country, and for the furthering of all that are ſtudious in the Art of Numbers, I haue laboured to ſet it forth in the moſt briefe, plaine, and eaſie manner that I could fit for the vnderſtanding of the weakeſt and meaneſt capacitie. In which if any thing ſhall ſeeme obſcure or doubtful to any man, I could wiſh my ſelfe were preſent to reſolue his doubts, for I haue indeauoured to make the Rules as briefe, ſhort and eaſie, as I could deuiſe.

In my firſt Book I haue intreated concerning vulgar Arithmatick, with new inuentions of my owne, in all the firſt foure parts of Arithmatick, *viz.* in *Addition* and *Subtraction*, with two ſeuerall kinds of *Multiplication*, not charging of the memory, neuer extant before in any Author that I haue read, with foure ſeuerall kinds of *Diuiſion*, the latter of them bringing the proofe by *Addition* of the figures vnder the diuidend, without any multiplication, or caſting away of nines, according to the accuſtomed manner.

Againe, in the worke of Fractions, I haue ſet them forth in plaine and perfit figures after another manner of my owne inuention, becauſe the fractionall figures in moſt bookes of Arithmatick were ſo vnperfit, that they were ſcarce to be deſcerned, and in this manner they will performe all fractionall operations, as well as if they were ſet out according to the vſuall manner. In the end of which Rules I haue ſhewed the reaſons and proofes of fractions by the known parts of Coyne.

Thirdly, in the ſecond part of the former booke, I haue ſet forth Reduction, both in Coyne ſterling waights, meaſures, time and motion; the Tables whereof are in the firſt part of the book, with diuers Rules how to bring pence, or farthings at the firſt worke into pounds, ſhillings and pence; with diuers queſtions wrought by Reduction, with Progreſsion Arithmaticall and Geometricall, with examples.

And laſtly, I haue ſhewed how to worke the Rule of 3 Direct and Conuerſt, both in whole numbers and fractions, after diuers ſeuerall manners of workings, and how to find the diuiſor in any queſtion, as alſo diuers wayes to worke Fellowſhip, Barter, Exchange,

Exchange, Allegation, Intereſt, Poſition, and all other operations Arithmeticall, with examples and briefe Rules of euery part.

In my ſecond booke of Decimall Arithmatick, I haue firſt deſcribed out the parts and vſe of the decimall Table, and how to ſet forth any number giuen in Decimalls.

Secondly, I haue ſhewed how to worke all the ſeuerall parts of Arithmatick, *viz. Numeration, Addition, Subtraction, Multiplication* and *Diuiſion* in Decimalls; with examples and proofes of euery worke in the knowne parts of Coyne.

Thirdly, I haue handled in as briefe manner as I could, the Rule of 3 Fellowſhip, Barter, Exchange and Intereſt in Decimall Arithmatick, as before in vulgar, in which you may perceiue the great labour that is auoided, in vulgar Arithmatick, with diuers examples and proofes of the ſame.

Laſtly, I haue added a ſmall Treatice of *Intereſt* and *Annuities*; with the manner how to calculate Tables or Breuiats at any rate, or yeares purchaſe giuen: all which I haue drawne into a pocket vollume. If therefore any Gentleman, Merchant, or other, be deſirous to haue further inſtruction, if they repaire to my lodging in *Coleman-ſtreet*, I ſhall be

be ready to giue them any ſatisfaction.

If therefore I ſhall find theſe my labours and indeauors to take that effect, which I do hope and wiſh for, I ſhall be thereby the ſooner incouraged to haſten the comming forth of the third part of this volume concerning the extraction of Rootes, with many eaſie operations and rules ſhewing the vſe of the Square and Cubicque rootes, concerning Menſurations of land, Timber, Board, Glaſſe and Stone, and the reduction of Meaſures from one proportion to another by their ſquares giuen: and laſtly, concerning Millitary affaires and Gunners Art; concerning the Arithmeticall worke, with demonſtration by examples, which I had intended to haue ioyned to this vollume, but that it would haue increaſed it far beyond a pocket book. And ſo hoping of your friendly cenſure & acceptance of theſe firſt fruits of my labours, I ceaſe, hoping to haue my true indeauors and meaning well taken, and the faults in the Printing friendly amended, deſiring a bleſsing from God vpon theſe my poore labours, I take my leaue, *London* in *Coleman-Streete*, this 18 of *Auguſt*, 1622.

John Johnſon.

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be

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The end of the Table.

IOHN-

IOHNSONS ARITHMETICK.

CAHP. I.

Numeration.

NVmeration is the first part of Arithmaticke, which sheweth how to pronounce the value of any number of figures giuen; which are expressed by tenne figures, whereof the tenth is a Cypher, signifying nothing of it selfe; but being ioyned with figures, helpeth to increase the value: the figures are these;

one, two, three, foure, fiue, six, seuen, eight, nine, cipher.

1. 2. 3. 4. 5. 6. 7. 8. 9. 0.

How to expreſſe the value of a number giuen.

If a number be giuen, whoſe value is to be expreſſed, you ſhall vnderſtand, that the figure next the right hand is the leaſt in valew, and ſignifieth ſimply his owne valew, as the figure of 1 doth ſignifie but one, and the fignre of 2 doth ſignifie but two, and the figure of 8 ſignifies but eight, and ſo of any other. And in the ſecond place towards the left hand, euery figure is in valew tenne, ſo that the figure of one there doth ſignifie tenne, the figure of 2 twenty, the figure of 8 eightie, and ſo of all other: in the third place towards the left hand, euery figure is in valew one hundred, ſo that the figure 1 in that place ſignifies one hundred, the 2, two hundred, &c. In the fourth place, euery figure is in valew one thouſand, ſo there the figure of one ſignifies one thouſand, the figure 2, two thouſand, &c. In the fifth place, euery figure is in value ten thouſand: in the ſixth place, one hundred thouſand; and in the ſeuenth place, one thouſand thouſands, or one million: in the eight place, ten millions: in the ninth place, one hundred millions:

lions: in the tenth place, one thouſand millions, or one milliot; and ſo infinitely names may be giuen to the valew of euery pricke, as is vſuall in the ſecond part of Arithmetick, of Number, Square, Cube, ſurſolid, &c. or in Aſtronomicall Arithmetick, Primes, Seconds, Thirds, Fourths and Fifths, &c.

Now to expreſſe the valew of any number giuen, ſet a prick with the pen ouer the fourth figure towards the left hand, and ouer the ſeuenth, and tenth; and ſo ouer euery third figure towards the left hand, to the end of your figures, as in this Example:

Thouſ. mill. Milliot. Mill. Thouſand.

. . . .

2 3 7 8 5 6 3 5 4 3 0 2 5 6 7.

Now begin and expreſſe the firſt foure figures towards the right hand, as if they ſtood alone, which are 2567, or two thouſand fiue hundred ſixty ſeuen. Then reade the figures belonging to the ſecond prick, which are 430, as if they ſtood alone thus, foure millions three hundred two thouſand fiue hundred ſixty ſeuen: then take the three figures belonging to the third prick, which

are 635, or ſixe millions three hundred fiftie foure millions three hundred and two thouſand fiue hundred ſixtie ſeuen: and ſo this whole ſumme is thus to bee read, two hundred thirty ſeuen thouſand eight hundred fifty ſixe millions three hundred fiftie foure millions three hundred and two thouſand fiue hundred and ſixty ſeuen; and ſo of any other ſumme.

CHAP. II.

Addition.

ADdition is the ſecond part of Arithmatick, and ſerueth to adde or collect diuers ſummes of ſeuerall denominations, and to expreſſe their totall value in one ſumme.

In Addition begin to adde your ſums at the right hand with the ſmalleſt numbers or denominations firſt, and gathering of their totall mark how many of the ſmaller makes one of the next greater; as if your addition be Farthings, for euery foure farthings carry one peny in mind to be added to the numbers

bers in the place of pence, and for euery 12 put one ſhilling into the number of ſhillings, and for euery 20 ſhillings, one pound into the place of pounds; and therefore to know how many of the ſmaller denominations, makes one of the next greater: I haue here added in this place the ſeuerall Tables of Coyne ſterling, of Weights, of liquid Meaſures, and drie Meaſures, of long Meaſures, of Time and Motion; which are very neceſſary to be knowne of euery Practicioner in Arithmatick, before he proceeds any further in the practice of Arithmatick, being vſed in euery particular Rule of Arithmatick more or leſſe.

The Table of Coyne Sterling.

	Pence	*Farth.*
Foure farthings makes one peny	1	4
One ſhilling is	12	48
One pound Sterling is 20 ſhillings	240	960
One hundred pound Sterling is	24000	96000

Example.

l.	*s.*	*d.*	*l.*	*s.*	*d.*	*q.*
785976.	17.	3	324.	8.	11.	1
80254.	10.	7.	222.	17.	3.	1
23547.	11.	0.	187.	10.	2.	0
7853.	12.	2.	354.	12.	1.	0
248.	00.	0.	1856.	00.	2.	0
93.	10.	1.	7859.	1.	11.	1
7.	11.	3.	3275.	1.	9.	0
Su. 897981.	12.	4.	14079.	12.	3.	3.

The explanation of these examples.

In the first example toward the left hand I begin with farthings, which are 3, which I set downe: then next 9 pence and 11 is 20, and 2 is 22, and 1 makes 23, and 2 makes 25, and 3 makes 28, and 11 makes 39 pence, or 3 shillings 3 pence; I set downe the 3 pence, and carry in mind the 3 shillings to be added to the place of shillings. Then adde the seuerall summes of shillings, which are 1. 1. 2. 7. 8, the totall is 19, and the 3 in mind makes 22 shillings; set downe the 2 shillings, and keepe two tennes to be added to the tennes of shillings, which are 3 tens, which

which makes 5 tennes, or 50 ſhillings; ſet downe the odde tenne to the 2 ſhillings, which makes 12 ſhillings, & carry 2 pound for the forty ſhillings to the next place of pounds, which are 5.9.6.4.7.2.4, and the 2 in mind makes 39; leaue the 9 vnder the place of vnites, and carry 3 tennes in mind, and 7.5.5.5.8.2.2, totall is 37; ſet downe the 7 vnder the place of tennes, and carry 3 in mind for the 30 tennes, which is 3 hundred: then 3 in mind, and 2.8.8.3.1.2.3, totall is 30; ſet a cypher, or 0 in the place of hundreds, and carry 3 for the 30 into the place of thouſands: then laſt of all, 3 in mind, and 3.7.1 makes 14 thouſand, and becauſe it is the laſt ſumme, you muſt ſet them all downe, placing the 4 vnder the place of thouſands, and the 1 one place more towards the left hand, and then the Totall ſumme of thoſe particulars will be 14079 pound, 12 ſhillings, 3 pence, 3 farthings, as appeareth in the example; and in the like manner is the other example to bee caſt vp into one Totall: and ſo I will here end with Addition of Coine, & put a ſeueral example of euery table for the full and perfect vnderſtanding of the ſaid tables, which are of great vſe in all the ſeuerall rules of Arithmetick.

The Table of Haberdepoyse weight.

Haberd. the pound.	*oun.*	*Dra.*	*Scruple*	*Graine.*
One pound is——	16	128	384	7680
One half pound is	8	64	192	3840
One quarter of a pound is——	4	32	96	1920
One eighth of a pound is——	2	16	48	960
One sixteenth of a pound is——	1	8	24	480

The Hundred.	*Pou*	*Ounc.*	*Dra*	*Scruple.*
One hundred is—	112	1792	14336	43008
One half hundred is——	56	896	7168	21504
One quarter hundred is——	28	448	3534	10752
One half quarter hundred is——	14	224	1792	5376

Example

Example of Weights.

C.	*qu.*	*li.*	*oun.*	*C.*	*q.*	*li.*	*oun.dr.*
27.	3.	27.	6	127.	3.	17.	8. 3.
18.	1.	17.	12.	118.	2.	10.	12. 1.
13.	2.	10.	3	33.	0.	0.	0. 0.
73.	0.	0.	5.	17.	1.	12.	2. 3.
83.	2.	5.	12	22.	3.	1.	7. 0.
2	2	2		17.	0.	10.	3. 0.
				2	1	2	
211.	2.	6.	6.	336.	2.	24.	00.7.

The Explanation.

In the Haberdepoyſe waight, 20 graines makes one ſcruple, 3 ſcruples one dram, 8 drams one ounce, 16 ounces one pound, 112 pound is one hundred of the Haberdepoyſe weight, wherby is ſold all kind of Merchandiſe vſuall in this Realme, and therefore in Addition of Waights Haberdepoyſe, for euerie 3 ſcruples adde one dramme, and for euery 8 drams one ounce, and for 16 ounces 1 pound, for 28 pound one quarter of a hundred, and for euery 4 quarters one hundred.

Firſt

firſt, I begin with the drams in the firſt example to the right hand, which are 3.1.3, totall is 7 drames, which I note downe vnderneath, becauſe they are leſſe then one ounce. Secondly the ounces are 3.7.2.12.8. totall is 32 ounces, or 2 pound, becauſe 16 ounces is one pound; which two I ſet vnder the place of pounds with a light touch of the penne for to remember it the better, and place a Cypher in the place of ounces.

Thirdly, the pounds are 2.10.1.12.10.17 totall is 52 pound, which is one quarter of a hundred, and 24 pound, place 24 pound vnder the place of pounds, and put one quarter, as before in the place of quarters of hundreds.

Fourthly, 1.3.1.2. 3 quarters, are 10 quarters, or 2 hundred and 2 quarters, or halfe a hundred; place 2 quarters in the place of quarters, and put ouer 2 into the place of hundreds for the 8 quarters.

Then 2.7. 2.7.3.8. 7 makes 36 hundred, place 6, and carry 3 for the 30: then ſay, 3. 1.2.1.3.1.2, totall is 13; place 3 there, and carry one for the 10, which one in mind, and 1.1 makes 3, which ſet downe, and the total is 336 hundred, 2 quarters, 24 pound, 0 ounces, 7 drammes; and ſo the other example

ample is in the ſame manner to be caſt vp, and ſo of all other.

The Table of Liquid Meaſures.

	Pints.
One pound or pint	1
One quart	2
One pottle	4
One Gallon	8
8 Gallons, a Firkin of Ale, Sope, or Herring	64
One Firkin of Beere	72
One Firkin of Salmon, or Eles	85
2 Firkins, or one Kilderkin of Beere	118
2 Kilderkins, or one Barrell	250
One Tirce of Wine	336
63 Gallons one Hogſhead of Wine	504
2 Hogſheads, or a Pipe or Butt	1008
2 Pipes, Butts, or a Tunne of Wine	2016

The Table of Dry Maſures.

	Pints.
One Pint	1
One Quart	2
One Pottle	4
One Gallon	8

One

	Pints.
One Pecke	16
4 Pecks one Bushell Land-Measure	64
5 Pecks, one Water-bushell	80
8 Bushels one Quarter	512
4 Quarters, on Chaulder	2048
5 Quarters one Waye	2560

The Table of Long Measure.

	Inch.
Three Barley Cornes in length, one Inch	1
One Foote	12
One Yard, or 3 Foote	36
Or 3 Foote 9 Inches, an Englisch Ell	45
Or 6 Foote one Fadom	72
Or 5 Yards and half, a Pole or Perch	198
Or one Perch in bredth, and 40 long, one Roode	198
Or 4 Perches breadth, and 40 long, an Acre of land	792
160 Square Perches, is one Acre	792

40 Roddes in length is one Furlong, and 8 Furlongs is an Englisch Mile.

The Table of Time.

	Minut.
One Minute	1
One Hower	60
One Day naturall, or 24 Howers	1440
One Weeke, or 7 Dayes	10080
One Moneth, or 4 Weeks, or 28 Dayes	40320
13 Moneths one Day 6 Houres, or 365 Dayes, one Yeare	525960

The Table of Motion.

360 Degrees, 21600 Minutes, 1296000 seconds	12 Signes.
30 Deg. 1800 min. 108000 sec.	1 Signe.
1 deg. 60 min. 3600 sec.	1 Degree.
1 min. is 60 sec.	1 Minute.
1 second	1 Second.
7776000 thirds makes the 12 Signes	1 Third.
466560000 fourths makes the 12 Signes	1 Fourth.
27993600000 fifths is 12 signs	1 Fifth.
1679616000000 sixths is 12 Signes	1 Sixth.

The explanation of these Tables, and the examples following.

First, in the example of Acres, Roods and Perches; for 40 Perches put 1 Rood into the place of Roods, and for euery 4 Roods one Acre.

Secondly, for euery 4 quarters of Inch, take 1 Inch, and for euery 12 Inches 1 foot, and for euery 3 foote, one yard.

Thirdly, for 16 pints take one pecke, and for euery 4 peckes one Bushell, into the place of Bushels.

Fourthly, for euery 8 pints of liquid measure, take one Gallon, and for euery 63 Gallons one Hogshead.

Fifthly, in the example of time; for 60, minuts take one houre, and for 24 houres one day, and for 365 dayes, one yeere.

Sixthly, for 4 nayles take one quarter of a yard, and for 4 quarters one yard, &c.

Lastly, in the example of motion, for 60 thirds, take 1 second, & for 60 seconds take one minute, and for 60 minutes take one degree, and for 30 degrees take one Signe.

And this is the vse of these Tables in Addition and Subtraction; for looke what you carry

carry ouer in Addition, that you muſt borrow in Subtraction, I wil heare adde examples of euerie kind, leauing the Reader to exerciſe himſelfe by the Rules before taught.

Example.

Acres,	*Rood.*	*per.*	*Feet.*	*Inch.*	*quart.*
127.	3.	21	124.	7.	3
246.	1.	12	246.	11.	4
17.	3.	22	134.	7.	2
27.	1.	8	120.	8.	0
37.	0.	17	72.	10.	2
2	2		3	2	
456.	2.	00	699.	9.	3.

Buſhel,	*Pecks,*	*Pints.*	*Yard.*	*Quar.*	*Naile.*
127.	3.	11	127.	2.	3
256.	1.	7	359.	1.	4
345.	0.	0	152.	3.	0
184.	2.	10	16.	0.	0
1	1		1	1	
913.	3.	12	655.	3.	3.

Yeares,	*dayes,*	*houres,*	*min.*	*ſeconds.*
356.	245.	16.	35.	20.
249.	100.	12.	30.	00.
756.	12.	00.	10.	12.
140.	27.	30.	25.	01.
1618.	00.	20.	00.	00.
1	3	1		
3120.	22.	07.	40.	34.

Signes,	*degrees,*	*minutes,*	*ſeconds,*	*thirds.*
11.	22.	32.	24.	18.
8.	19.	17.	20.	12.
10.	07.	00.	08.	15.
2.	17.	35.	50.	59.
3.	29.	30.	12.	00.
3	1	1	1	
37.	05.	55.	55.	44.

The Proofe of Addition.

The proofe of Addition is made by Subtraction; for if you ſubtract the numbers which you added from the totall of the Addition,

dition, there will remaine nothing, if the worke be truly done.

Example.

	l.	*s.*	*d.*	*q.*
	378567.	19.	10.	1.
	240023.	10.	2.	0.
	854326.	07.	1.	0.
	785634.	13.	3.	2.
	320500.	00.	11.	1.
	2	2		
Totall,	2579052.	11.	4.	0.

First, adde together the greatest Summes in valew in the place of hundred thonsands, wnich makes 23, which take from 25, and there will remaine 2: then the figures in the fifth place, 26 taken from 27, there will remaine 1. Thirdly, the figures in the place of thousands, makes 17, which taken from 19, leaues 2: then 19 in the place of hundreds taken from 20, leaues 1: and againe, 13 in the place of tennes from 15, leaues 2: and lastly, 20 in the place of vnites from 22 ponnd, leaues 2 pound: then 49 shillings from 2 pound 11 shillings, leaues 2 shillings:

lings : alſo 2 ſhillings 3 pence in the place of pence, from 2 ſhillings 4 pence, leanes 1 : and laſt of all, 4 farthings from 1 penny, leaues nothing, which prooues the worke to be truly wrought.

	l.	*s.*	*d.*	*q.*
The totall.	2579052.	xx.	4.	ø.
	xxxxxx,	2.	x.	ø.

The ſecond proofe of Addition.

Cut of the vppermoſt numbers with a daſh of the pen, and adde the remayner into one Totall ; aud then ſubtract that ſum from the whole totall, aud the remayner will bee the numbers which you cut off, if the worke be true, elſe not.

Example.

	378567.	19.	10.	1.	
	240023.	10.	2.	0.	
	854326.	7.	1.	0.	
	785634.	13.	3.	2.	
	320500.	00.	11.	1.	
	2	2			
The total	2579052.	11.	4.	0.	*of all.*
Subt.	2200484.	11.	5.	3.	*the ſum.*
The	378567.	19.	10.	1.	*proof.*

And ſo much ſhall ſuffice to haue ſpoken of Addition, and the proofe thereof.

Queſtions of Addition.

What number is that, to the which if you doe adde 45, the totall will be 357.

Anſwer: Subtract 45 from 357, remaines 312.

Example.

$$\begin{array}{r} 357 \\ 45 \\ \hline 312 \end{array}$$

What three numbers are thoſe, to which if you adde 27, 36, and 45, their products ſhall be equall, and the ſumme ariſing ſhall be 120.

Proofe.

120	120	120	93
27	35	45	27
93	89	75	120

What number is that, to the which if you do adde 354 pound, 7 ſhillings, 9 pence, the totall will bee 512 pound, 15 ſhillings, 0 penny. Anſwere: Subtract 354 pound,

7 ſhillings, 9 pence, from 512 pound, 15 ſhillings, 0 penny, and the remainder will bee 158 pound, 7 ſhillings, 3 pence, which is the number that you doe ſeeke.

Example.

l.	*s.*	*d.*
512.	15.	0.
354.	7.	9.
158.	7.	3.

CHAP. III.

Subtraction.

SVbtraction ſerueth to deduct one ſum from another; the leſſer from the greater, and to ſhew the remaines.

Place your greater number, from which the Subtraction is to be made, in the vppermoſt part, and the number to be ſubtracted, or deducted right vnderneath euery figure vnder his like kind, or denomination, *viz.* pounds vnder pounds, ſhillings vnder ſhillings, and pence vnder pence, &c. in this manner.

Lent.

	l.	*s.*	*d.*	*q.*
Lent.	7756.	13.	10.	1.
Payd	3949.	17.	11.	2.
Reſt.	3806.	15.	19.	3.
Proofe.	7756.	13.	10.	1.

Then begin your ſubtraction at the left hand, at the ſmalleſt numbers; but if the loweſt figure of the vndermoſt numbers be the greateſt, that it cannot be abated out of the number aboue it, then adde one of your next greater denomination, and make your ſubtraction from both, noting the remainer; as if you haue 10 pence to take frō 7 pence, adde one ſhilling, or 12 pence, vnto 7 pence, that maketh 19 pence; then take 10 pence from 19 pence, and there will remaine 9 pence, which note downe vnder the 10 pence: and becauſe you did borrow one ſhilling, therefore in the number of ſhillings you ſhall take away one more then it is, in the next place of ſhillings, and this rule is generall, in Coyne, Meaſure, Time, Motion, or any other thing elſe whatſoeuer.

Subtraction.

1. *Example of Subtraction of Coyne.*

	l.	*s.*	*d.*	*q.*
Lent.	789786.	17.	11.	3.
Paid.	692583.	19.	10.	1.
Reſt.	97202.	18.	1.	2.
Proofe.	789786.	17.	11.	3.

2. *Example of Weights.*

	C.	*q.*	*l.*	*oun.*
Lent.	127.	3.	27.	10.
Paid.	38.	2.	24.	15.
Reſt.	89.	1.	2.	11.
Proofe.	127.	3.	27.	10.

3. *Example of Time.*

	Yeeres,	*daies,*	*houres,*	*min.*
Totall.	1618.	340.	20.	56.
Deduct.	1581.	122.	15.	59.
Reſt.	0037.	218.	04.	57.
Proofe.	1618.	340.	20.	56.

4. Example of Motion.

	Sig.	*Deg.*	*Min.*	*Second.*	*Thirds.*
Totall.	11.	22.	36.	52.	40.
Subt.	7.	29.	51.	42.	56.
Reſt.	3.	22.	45.	09.	44.
Proofe.	11.	22.	36.	52.	40.

The explanation of theſe examples.

In the firſt example of Coyne, begin your ſubtraction at the right hand, ſaying; 1 farthing from 3 farthings, leaues 2 farthings, which note downe vnder the 1 farthing. Then 10 pence from 11 pence, leaues 1 penny. Thirdly, 19 ſhillings from 17 ſhillings you cannot haue, therefore take one pound, or 20 ſhillings, and adde to 19 ſhillings, ſaying, 19 ſhillings from 37 ſhillings, reſts 18 ſhillings, which note downe. Then 1 that you borrowed, & 3 pound, is 4 pound from 6 pound, leaues 2 pound to ſet downe vnder 3. Then 8 from 8 leaues nothing, place there a Cypher, or 0 vnder 8. Then 5 from 7 reſts 2; then 2 from 9 leaues 7,

which alſo note againe; 9 from 8 cannot be taken, then make it 10 more, and ſay 9 from 18 leaues 9, which ſet downe: and laſt of all, 1 borrowed and 6 is 7, from 7 leaues nothing; and the worke is ended, and the remayner will bee 97202 pound 18 ſhillings 1 penny 2 farthings, as appeareth in the example before going.

The expoſition of the ſecond example.

Firſt, take 15 ounces from 10, which cannot be, then adde 1 pound, or 16 ounces to 10, makes 26; then ſay, 15 from 26 leaues 11 ounces, which note downe: then 1 borrowed and 24 is 25, from 27 pound leaues 2 pound remaining; then 2 quarters from 3 quarters, leaues 1 quarter remaining; then 8 from 7 cannot bee, therefore take 8 from 17, reſt 9, which note downe: then one borrowed and 3 makes 4, from 12 reſts 8, and the worke is done, and the remaine is 89 hundred 1 quarter 2 pound 11 ounces.

3 Example.

Firſt, take 59 minutes from 56 minuts cannot be, but then take 59 minuts from 60 minutes,

minutes, or one houre, and there will remaine 1 minute, which adde to 56 minutes, and that will make 57 minntes, which note downe in the place of minutes: then 1 borrowed and 15 houres makes 16 houres, which taken from 20 houres leaues 4, which note vnder the 15; and then 2 dayes from 0 cannot be, but 2 from 10, and there will remaine 8, which note downe: then 1 borrowed and 2 makes 3, from 4 leaues 1; also 1 from 3 leaues 2: lastly, 1 from 8 leaues 7, and 8 from 11 leaues 3; then 1 borrowed and 15 makes 16, from 16 leaues nothing, and the remayner will bee 37 yeares 218 dayes 4 houres 57 minutes; the like is done in the other example of Motion, and therefore here needlesse to be rehearsed.

To subtract from a Vnite.

Set downe with your pen a vnite in any place, adding Cyphers vnto it, and the seuerall numbers which you will subtract from it of pounds, shillings and pence right vnderneath: then note what each seuerall number of your lowest numbers doth want of 9 vnto the place of vnites, and set that right vnder for the remayner: and lastly, note what your shillings and pence

doth

doth want of 20 ſhillings, and ſet that downe for your remaynor, and the worke is ended.

Example.

	l.	*s.*	*d.*
Lent.	1000000.	00.	00.
Payd.	232864.	17.	03.
Reſt.	767135.	2.	9.
Proofe.	1000000.	00.	0.

The proofe of Subtraction.

The ſureſt proofe of Subtraction is made by Addition: for if you doe adde the numbers remaining, vnto the numbers deducted, they will returne your former Summe, if the worke be truly wrought, as wil appeare in the proofe of all the ſeueral examples before going, and therefore here againe in this place needleſſe to be rehearſed. Only I will adde one for examples ſake.

In the laſt example, the numbers which did remaine, were 767135 pound 2 ſhillings 9 pence, and the numbers deducted, 232864 pound

pound 17 ſhillings 3 pence; theſe two numbers added together, ought to make a vnite in the ſeuenth place; wherefore I adde 9 pence to 3 pence, makes 1 ſhilling; and 1 ſhilling to 17 ſhillings, makes 18 ſhillings, and 2 ſhillings makes 20 ſhillings; then 1 and 4 is 5, and 5 is 10, which is one in the next place: then 1 and 3, and 6 is 10; and 1 1.8 makes 10, and 1.7.2 makes 10, and 1.6.3 is 10, and laſtly 1.7.2 makes 10, or one vnite.

Mul-

CHAP. IIII.

The Table of Multiplication.

1	2	3	4	5	6	7	8	9
2	4	6	8	10	12	14	16	18
3	6	9	12	15	18	21	24	27
4	8	12	16	20	24	28	32	36
5	10	15	20	25	30	35	40	45
6	12	18	24	30	36	42	48	54
7	14	21	28	35	42	49	56	63
8	16	24	32	40	48	56	64	72
9	18	27	36	45	54	63	72	81

THis Table of Multiplication muſt bee learned perfectly by heart, for to know readily what the multiplication of any two digit numbers vnder nine, or vnto nine doe make, and then Multiplication will be very eaſie: for Multiplication is a number of additions ſpeedily performed; as if you ſhould ſay,

ſay, How many in number is 8 times 7, if you ſhould ſet downe 7 eight times one vnder another, and adde them together, the totall will be 56: but if you looke in the Table for 8 in the head, and 7 in the ſide, you ſhall finde vnder 8, right againſt 7 in the the ſame paralell 56; or if you find 8 in the ſide, and 7 in the head, the like number will appeare, and theſe numbers in the table are to be fit in memory.

1. *Example according to the vſuall way.*

87968. *The multiplicand.*
987. *The multiplier.*

Firſt, begin your multiplication at the right hand, ſaying, 7 times 8 make 56, place 6 vnder the 7, and keepe 5 in mind, to bee added to the product of the multiplication of 7 by 6, ſaying, 7 by 6 makes 42, and 5 in mind is 47; ſet 7 downe vnder the 6, and keepe 4 in mind: then 7 by 9 is 63, and 4 makes 67; ſet 7 downe, and keepe 6 in mind: then 7 by 7 is 49, and 6 is 55; place 5 and keepe 5 in mind: laſtly, 7 by 8 is 56, and 5 is 61, which ſet downe the 1 firſt, and the

6 one

6 one place more towards the right hand; and ſo the multiplication by the firſt figure 7 is done, then cancell the 7 of your multiplyer, and your worke will ſtand, as in this example.

87968
987
615776

Secondly, begin with 8, the ſecond figure of your multiplier, ſaying, 8 times 8 is 64; place the 4 vnder the ſaid 8, and keepe the 6 in mind: then 8 by 6 is 48, and 6 makes 54; ſet downe 4 in the next place, and keepe 5 in mind: then 8 by 9 is 72, and 5 makes 77; ſet downe 7, and keepe 7 in mind: then 8 by 7 is 56, and 7 makes 63; ſet downe 3, and keepe 6. Laſtly, 8 by 8 is 64, and 6 makes 70; ſet the 0 firſt, and the 7 one place more towards the left hand, and cancell the 8 of your multiplier, and the worke will ſtand thus.

87968
987
615776
703744

Thirdly,

Thirdly, begin with 9, the laſt figure of your multiplyer, ſaying, 9 by 8 is 72; place the 2 vnder the ſaid 9, and keepe 7: then 9 by 6 is 54, and 7 is 61; place 1, and keepe 6: then 9 by 9 is 81, and 6 is 87; place 7, and keep 8: then 9 by 7 is 63, and 8 is 71; place 1, and keepe 7: laſt of all, 9 by 8 is 72, and 7 is 79; place the 9 firſt, and the 7 one place more towards the right hand, and the whole worke is ended, then gather the totall by addition.

1. Example.

87968 *multiplicand.*
987 *multiplier.*

615776
703744
791712

86824416

2. Example

2. *Examples with Cyphers.*

```
        703286501
            32057
-----------------
       4923005507
     3516432505
   14065730020
  2109859503
-----------------
  22545255362557
-----------------
```

The exposition of this example.

First, 7 by 1 is 7, which note downe: then 7 by 0 is nothing, set down a 0 in that place: and next 7 by 5 is 35, set 5, and carry 3: then 7 by 6 is 42, and 3 is 45, place 5, & carry 4: then 7 by 8 is 56, and 4 is 60, set downe a 0, and carry 6 againe: 7 by 2 is 14, and 6 makes 20, set dowue a 0, and carry 2: then 7 by 3 is 21, and 2 makes 23, place 3, and carry 2: then 7 by 0 is 0, leaue the 2 in that place: then lastly, 7 by 7 is 49, being the last number set downe all the 9 vnder 7, and the 4 one place more to the left hand, and the

the worke will then ſtand thus.

703286501
32057

49230055O7

Secondly, cancell 7, and then ſay, 5 by 1 makes 5, place that 5 vnder the 0; and then 5 by 0 is 0, place a 0 vnder the 5 in the next place; and then 5 by 5 is 25, ſet downe 5, and carry 2: then 5 by 6 is 30, and 2 makes 32, ſet downe 2, and carry 3: then 5 by 8 is 40, and 3 makes 43, place 3, and carry 4: alſo 5 by 2 is 10, and 4 makes 14, ſet downe 4, and carry 1: then 5 by 3 is 15, and 1 makes 16, ſet downe 6, and carry 1: then 5 by 0 is 0, ſet downe the 1 there: laſt of all, 5 by 7 is 35, ſet them all downe, and the worke will then ſtand thus.

703286501
32057

49230055O7
3516432505

Thirdly, cancell the 5, and then ſay, 0 by 1

is 0, place a 0 vnder the 0 of your multiplier, & thē proceed to the next figure of your multiplier, which is 2, ſaying, 2 by 1 is 2, place the 2 vnder the ſaid 2 of your multiplier: then 2 by 0 is 0, which ſet downe: then 2 by 5, makes 10, ſet downe a 0, and carry 1: then 2 by 6 is 12, and 1 is 13, ſet downe 3, and carry 1: alſo 2 by 8 is 16, and 1 is 17, ſet downe 7, and carry 1: alſo 2 by 2 is 4, and 1 makes 5, which ſet downe: againe, 2 by 3 is 6, which ſet downe: laſtly, 2 by 7 is 14, which ſet downe, and the worke will ſtand, as in this example.

```
      703286501
          32057
-------------------
     4923005507
    3516432505
   14065730020
```

Fourthly, cancell the 2, and ſay, 3 by 1 is 3, which place right vnder the ſaid 3: then 3 by 0 is 0, and worke in all reſpects as before, and the worke being ended, will ſtand thus.

703286501

```
        703286501
            32057
-----------------------
       4923005507
      3516432505
    14065730020
   2109859503
-----------------------
   22545255362557
-----------------------
```

I will here adde ſome few examples to be wrought by the pen, without any troubling of the memory with bearing ought in mind.

Example.

```
        87968  multiplicand.
          987  multiplier.
-----------------------
         46456
        56932
       57464
      64628
      68572
     72314
-----------------------
Product. 86824416
```

2. Example.

79648039	*multiplicand.*
8976	*multiplier.*

53240154
42464808
64250263
49328601
85370281
63146207
74360272
56282404

71492079806 4 *Product.*

The explanation of the worke by the pen, without charging the memorie.

The first example.

87968
987

Firſt, I multiply al the figures of my multiplicand

tiplicand by 7, the loweſt figure of my multiplier, ſaying, 7 by 8 is 56, put 6 vnder the 7, and 5 vnder the 8: then 7 by 6 is 42, leaue the 2 vnder 5 laſt placed, and ſet the 4 one place more towards the left hand vnder the 9: then 7 by 9 is 63, leaue 3 vnder the 4 laſt placed, and ſet 6 one place more to the left hand vnder 7: then 7 by 7 is 49, leaue 9 vnder the 6 laſt placed, and the 4, ſet one place more to the left hand vnder the 8: laſtly, 7 by 8, makes 56, leaue 6 vnder the 4, & place 5 one ſpace more to the left hand, as before, then cancell 7 of your multiplier, and the multiplication by the firſt figure is ended, and the worke will ſtand thus.

Example.

87968
987

46456
56932

Then for the ſecond worke, ſay, 8 by 8 is 64, place 4 vnder the ſaid 8, and put 6 vnder the next figure 3: then 8 by 6 makes 48, leaue 8 vnder 6, and put 4 vnder the next 9:

and ſo working in all reſpects as at the firſt, and your ſecond worke will ſtand thus, as in this example.

87968
987

46456
56932
57464
64628

Laſtly, cancell 8 your multiplier, and then multiply by 9, as is before taught, placing the firſt figure of your product vnder the figure multiplying, and the worke being ended, it will ſtand thus; and laſtly, gathering the totall by addition, it is 868244 16; as in this example.

87968
987

46456
56932
57464
64628
68572
72314

Product. 868244 16

There

There is no difficulty in this kind of working, but onely when there falls a 0 in in the multiplicand, or multiplier; for if there be a cypher, then you must fill vp the places as you worke, either with pricks, or cyphers, as if you had figures to set in their places, and the rest of the work is as before, is taught in the third example; but I will here adde one example, hauing all the difficulties that may happen, for the better vnderstanding hereof.

Example.

```
                70921034
                    1293
-------------------------
                02000012
               21076309
               08100236
              63018907
             01000008
            14084206
            70921034
-------------------------
Product.    91700896962
-------------------------
```

Example.

```
        8007390214736 8
                179852
-----------------------------
        0010100001011 6
       1600468042846 2
      0003140102313 40
     4000555005055 0
     0052701035246 4
    6400642068264 8
    0062801036257 2
   7200371089637 4
   0042601024245 6
  5600913047891 2
  8007390214736 8
-----------------------------
14401451449008429536
-----------------------------
```

How to multiply, and to bring the product in the last line.

Place your numbers right one vnder the other, as in the common way; then make a right line somewhat distant from the first numbers with your pen, as in the example following.

87968

```
 87968
   987
 5645
------
615776
```

Then begin and ſay, 7 by 8 is 56, place the 6 vnder the line vnder the 7, and the 5 aboue the line in a ſmaller figure in the next place towards the left hand: then 7 by 6 is 42, and the 5 aboue the line makes 47, leaue 7 vnder the 8, and ſet the 4 againe aboue the line: then 7 by 9 is 63, and the 4 aboue the line makes 67, place 7 there, and ſet the 6 in the next place aboue the line: then 7 by 7 is 49, and 6 aboue the line makes 55, leaue 5 there, and put 5 againe ouer the line: laſtly, 7 by 8 makes 56, and the 5 laſt placed makes 61, place that whole ſumme vnder the line, and the worke wil ſtand, as aboue in the example.

Secondly, draw a line againe a little diſſtant, as before from the laſt product, as in the example following.

Example.

87968
987
5645

61577|6
68670|

765321

Then ſay, 8 by 8 is 64, and 7 makes 71, place 1 vnder the 7, and ſet 7 aboue the line: then 8 by 6 is 48, and the two ſeauens betweene lines makes 62, place 2 vnder the 7, and ſet 6 againe ouer the line: then 8 by 9 is 72, and 6 makes 78, and 5 makes 83, place 3 vnder the line, and 8 aboue the line: then 8 by 7 is 56, and 8 makes 64, and 1 makes 65; place 5 vnder the line, and ſet 6 aboue: laſtly, 8 by 8 is 64, and 6 makes 70, and 6 makes 76, place them both downe; and the worke will ſtand as aboue in the example.

Thirdly, draw a line againe, as before, a little diſtant from the laſt product, as in this example.

Example

Example.

87968
987
5645

61577|6
68670|

76532|1
7967 |

86824416 *Product.*

Thirdly, ſay 9 by 8 is 72, and 2 makes 74, place 4, and put 7 ouer the line: then 9 by 6 is 54, and 10 makes 64, place 4 vnder the line, and put 6 aboue: then 9 by 9 is 81, and 11 aboue makes 92, leaue 2 vnder the line, and 9 ouer the line: then 9 by 8 is 63, and 15 makes 78, leaue 8 vnder the line, and 7 aboue: laſtly, 9 by 8 is 72, and 14 makes 86, place them both vnder the line, and then bring downe the two figures which are cut off by two right downe lines, which are 1 and 6, and the worke is ended, and the worke will ſtand, as appeareth in the example aboue

boue, and the totall product is in the last line, 86824416; and this doth not charge the memory, for al the figures are set downe in view, and to bee seene at the first sight, and this is the second kind of multiplication, without charging of the memory.

```
        79648039
            8976
        5324025
-----------------
       47788823|4
       75461260|
-----------------
      60532509|6
      86470390|
-----------------
     77737486|0
     85470370|
-----------------
    714921798064
-----------------
```

Diui-

CHAP. V.

Diuiſion.

SEt your Diuidend, which is the number to be diuided in the vpper part, and the Diuiſor next to the left hand, vnder the greateſt figures in value of your Diuidend: If the vpper numbers bee greater then the lower, or elſe place your diuiſor one place more towards your right hand, as in this example.

Quotient.

Diuidend. 78567 (
Diuiſor. 84

If you would diuide 78567 by 84, place them as aboue; for becauſe you cannot haue 8 out of 7 in the Diuidend, therefore place your 8 one place more towards the right hand, and the 4 next to it, and your quotient you muſt place at the right ſide of your numbers behind a crooked line. But I will firſt giue an example of Diuiſion by one figure: I would diuide 65490 pound amongſt 5 men; place your numbers thus.

Example.

Example.

```
2044
65490 (13098  The quotient.
55555
```

Firſt, I ſeeke how oft 5 is in 6, this I may haue but once; then put 1 in the quotient beyond the crooked line, and take 5 out of 6, and there will reſt 1, ſet that ouer 6, and then remoue your diuiſor one place more to the right hand, and then ſeeke you how many times 5 may be had in 15, and the anſwer is, thrice, therefore place 3 in the quotient, and by it multiply your diuiſor 5, makes 15, which taken out of 15, leaues nothing, place a 0 ouer the 5, and remoue your diuiſor, and ſeeke how oft you may haue 5 in the 4 ouer it, but you cannot haue it once; wherefore put a 0 in the quotient, and remoue your diuiſor, and ſeeke how many times you may haue 5 in the figures ouer and behind it, which are 49, and you may haue it nine times, put 9 in the quotient, and by it multiply your diuiſor 5, makes 45, which taken from 49, leaues 4, which place aboue the 9. And laſtly, remoue againe your Diuiſor 5 vnder

vnder the 0, and ſeeke how many times 5 is in 40, and you ſhall find it 8 times, place 8 in the quotient, and by it multiply 5, makes 40 which taken from 40, leaues nothing remaining, and the worke is ended, and will ſtand thus, as in the example, and I find, if I diuide 65490 pound amongſt 5 men, euerie man ſhall haue for his part 13098 pound.

```
20044
65490 (13098
55555
```

And this is the order of Diuiſion for one figure: but if your Diuiſor doe conſiſt of more figures then one, then you muſt take the firſt figure of your Diuiſor no oftner out of the Diuidend, then you can alſo take euery ſeuerall figure of your Diuiſor, out of the ſame figures of the Diuidend ſtanding aboue them, as for example.

If you would diuide 86824416 by 987, which was one of the products of the multiplications in the rules before going, for a triall of your former worke, then place your numbers, as in the example following.

Example

Example.

8682441 6 (8

9 8 7

Then I ſeeke how oft I may haue 9 in 86, I find I may haue it 9 times; but if I conſider the next figure 8 of my Diuiſor, I cannot haue alſo 9 times 8 out of the numbers remaining; if I take 9 times 9, which is 81, out of 86, there will remaine but 5; and then 9 times 8, the next figure of my diuiſor, makes 72, which cannot be taken out of 58 which will remaine; therefore I place 8 in the quotient, and by that I multiply all the figures of my Diuiſor, 987 makes 7896, which taken from 8682, leaues 786 aboue them: and the worke will ſtand thus.

7 8 6

8682441 6 (8

9 8 7
7 8 9 6

Secondly

Secondly, I remoue my Diuisor 987 one place nearer the right hand, and then I seeke how oft I may haue 9 in 78, which I see I can haue but 7 times, so I put 7 in the Quotient, and by that 7, I multiply my Diuisor 987, makes 6909, which taken from 7864, the numbers aboue them there will remaine 955, and the worke will stand thus.

Example.

```
      95
     7865
-------------------------
  86824416 (87
-------------------------
     9877
    78969
     698
      90
```

Thirdly, againe I remoue my diuisor 987 one place nearer the right hand, and seeke how many times I may haue 9 in 95, and I find I may haue it 9 times, which 9 I set into the Quotient, and by it multiply 987, makes 8883, which taken from 9554 leaues 671, and the worke will stand thus.

Example.

```
      67
     955
    78651
-----------------------------
  86824416 (879
-----------------------------
     98777
    789693
      898
       88
```

Fourthly, I remoue my Diuisor againe, and seeke how oft I may haue 9 in 67, and I see I can haue it but 6 times, then I put 6 in the quotient, and by it multiplie 987, makes 5922, which taken from 6711, leaues 789, and the worke will stand in the example following.

Example

Example.

```
      67
    9558
  786519
-----------------------------
  86824416 (8796
-----------------------------
    987777
  7896932
     8988
      892
      59
```

Laſtly, I remoue my Diuiſor againe, and ſeeke how oft I may haue 9 in 78, and I find I may haue it 8 times, which 8 I put into the quotient, and by it I multiply my Diuiſor 987 makes 7896, equal vnto the numbers aboue; and ſo being taken away, leaues nothing remaining, and proues the multiplication to be truly wrought, as appeareth in the example following.

Example.

```
      67
    9558
  786519
-----------------------
  86824416 (87968
-----------------------
    9877777
  78969327
     898886
      8929
      599
       78
```

The third Example of Diuision.

The second kind of Diuision is this: first, place your diuidend & diuisor, as in the former Examples, & then hauing found out the figure of your quotient, begin with the least figure of your diuisor towards the right hād first, and multiply that by the figure of the quotient found, and then subtract the sum of the multiplication of that figure from the figure aboue the same, if it exceed not 9; but if the product be aboue 9, then for euery 10 beare

beare one in mind to bee added to the product of the multiplication of the ſecond figure of your Diuiſor by the quotient; and ſo in all reſpects worke for euery other figure, and you ſhall need make no more figures aboue your Diuidend then neceſsitie ſhall require, as for example.

I would diuide the product of the multiplication in the former Chapter of 79648039 by 8976, which was found to be as followeth, *viz.* 714920798064 by 8976: firſt, I place my Diuidend and Diuiſor as followeth.

Quotient.

Diuidend. 714920798064 (7

Diuiſor. 8976

Then firſt I ſeeke how often I may haue 8 in 71, I find by triall I can haue it but 7 times: then hauing placed 7 in the Quotient, I firſt multiply 6, the leaſt, or ſmalleſt figure in value by 7, makes 42; then I ſay, 42 from 42, reſt 0, and carry 4 for the fortie in mind; then I cancell the 2 ouer the 6, and place a 0 in the roome ouer it. Secondly, I ſay, 7 by 7 is 49, and 4 in mind makes

53, from 59 leaues 6, and carry 5 ~~5~~ cancell the 9, and place 6 ouer it. Thirdly, 7 by 9 is 63, and 5 in mind is 68, from 74 leaues 6, and carry 7, cancell the 4, and place 6 aboue it: also 7 by 8 is 56, and 7 makes 63, which taken from 71, leaues 8 remaining, which 8 place ouer the 1, and cancell the 71, and the first worke will stand thus.

8660
71492079 8064 (7
8976

Secondly, I remoue my Diuisor 8976, and seeke, how many times I may haue 8 in 86, I find 9 times; then I multiply 6 by 9 placed in the Quotient, makes 54, which taken from 60, leaues 6; place 6 aboue the first 0, and carry 6 for the 60: then say, 9 by 7 is 63, and 6 in mind makes 69, from 70 leaues 1, and carry 7 in mind; cancell the 0 ouer the 7, and place the 1 ouer the 0. Againe, 9 by 9 is 81, and 7 in mind is 88, which taken from 96, leaues 8 to bee placed aboue the first 6, and carry 9 in mind: lastly, 9 by 8 is 72, and 9 makes 81, which taken from 86, leaues 5 to bee placed aboue the 6, and the worke will stand as followeth.

Example.

Example.

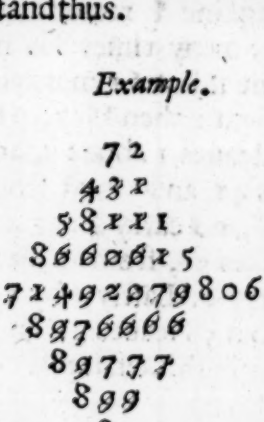
```
   581
  86606
 714920798064 (79
  89766
   897
```

Thirdly, againe I remoue my Diuisor, and seeke how many times 8 is in 58, and I find I can haue it but 6 times, which I place in the Quotient: then I say, 6 by 6 makes 36, from 37 leaues 1 aboue 7, and carry 3: then 6 by 7 is 42, and 3 is 45, from 46 leaues 1, aboue the 6, and carry 4: againe, 6 by 9 is 54, and 4 makes 58, from 61 leaues 3 aboue the 1, and carry 6. Lastly, 6 by 8 is 48, and 6 makes 54, from 58 leaues 4, and the worke stands thus, as in this example.

```
    43
   5811
  866061
 714920798064 (796
  897666
   8977
    89
```

Fourthly, I remoue my Diuiſor, and ſeeke how oft I may haue 8 in 43, and I find but 4 times, I place 4 in the Quotient. Then 4 by 6 makes 24, from 29, leaues 5, and carry 2, ſet 5 ouer the 9: then 4 by 7 is 28, and 2 makes 30, from 31, leaues 1, and carry 3. Againe, 4 by 9 is 36, and 3 makes 39, from 41 leaues 2, and carry 4. Laſtly, 4 by 8 is 32, and 4 is 36, from 43, leaues 7, and the work will then ſtand thus.

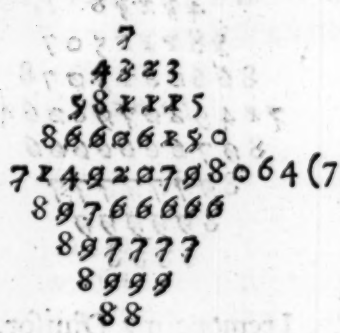
Example.



Fifthly, I remoue my Diuiſor, and ſeeke how oft I may haue 8 in 72; I find 8 times, which placed in the quotient, I multiply 6 by 8, makes 48, from 48, leaues 0, and carry 4: then 8 by 7 makes 56, and 4 is 60, from

65 leaues 5, and carry 6: then 8 by 9 is 72, and 6 makes 78, from 81, leaues 3, and carry 8; then 8 by 8 makes 64, and 8, is 72, from 72 leaues 0 remaining, and the worke will ſtand thus.

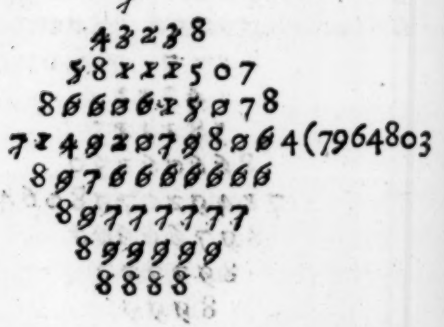
Example.



Sixthly, I remoue my Diuiſor, and ſeeke how oft I may haue 8 in 3, which I find not once; I place a 0 in the Quotient, and remoue my Diuiſor one place more and ſeeke how many times 8 is in 35; I find I can haue it but 3 times, I place 3 in the Quotient beyond the 0 laſt placed, and ſay, 3 by 6 is 18, from 26 reſts 8, and carry 2: then 3 by 7 is 21, and 2 is 23, from 30 leaues 7, and carry

carry 3 : againe, 3 by 9 is 27, and 3 is 30, from 30 leaues a 0, and carry 3 : alſo 3 by 8 is 24, and 3 is 27, from 35 leaues 8; and the worke will ſtand thus.

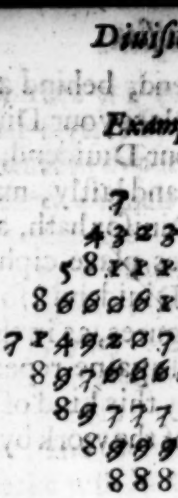
Example.



Laſtly, I remoue my Diuiſor, and ſeeke how oft I may haue 8 in 80; I find 9 times, I place 9 in the Quotient, and ſay, 9 by 6 is 54, from 54 leaues 0, & carry 5: then 9 by 7 is 63, and 5 is 68, from 68 leaues 0, & carry 6: Then 9 by 9 is 81, and 6 is 87, from 87 leaues 0, and carry 8: laſt of all, 9 by 8 is 72, and 8 makes 80, from 80 there will remaine nothing but cyphers, and the worke is quite ended, and will ſtand, as in the example following.

Example.

Example.



The fourth and laſt kind of Diuiſion, is the moſt abſolute, ſpeedy, and eaſie, not charging the memory at all, with keeping any numbers in mind; and alſo the proofe of your work is made by Addition, and not by multiplication, as hath heretofore been commonly vſed, but the figures of your worke are by Addition, the proofe of your worke, as ſhall appeare by examples following.

The third Worke.

Firſt, place your Diuidend betweene two paralel lines, and your Quotient at the right ſide

ſide of your Diuidend, behind a crooked line, as before; then place your Diuiſor next to the left hand of your Diuidend, behind a perpendicular line: and laſtly, marke how many figures your Diuiſor hath, and in the roome of thoſe figures place ciphers vnder the figures of your Diuidend, ſo many as your Diuiſor hath figures, as in the laſt example; which I will againe repeate in this place, and work it by this kind of Diuiſion, making the proofe of the work by Addition of the ſame figures.

Example.

Diuiſor.	*Diuidend.*	*Quotient.*
8976	71492079 8064	(
	0000	

Firſt, I point to the firſt cipher towards the left hand, and ſeeke how oft I may haue 8, the greateſt figure in value of my Diuiſor, hauing reſpect to the other figures of my Diuiſor, to take them alſo as often, out of the figures aboue, and I find I can haue it but 7 times, which 7 I place in the Quotient,

ent, and by that 7 I multiply my Diuiſor 8976, ſaying firſt, 7 by 6 is 42, place the 2 vnder the loweſt cypher towards the right hand, and carry 4: then 7 by 7 is 49, and 4 is 53, ſet 3 vnder the next place to the left hand, and carry 5: then 7 by 9 is 63, and 5 is 68, place the 8 in the next place, and carry 6. Laſtly, 7 by 8 is 56, and 6 in mind makes 62, which place downe in their places, and the totall is 62832, to be ſubtracted from 71492, and there will remaine 8660; and the worke will ſtand thus.

Example.

8660

8976 | 7x49207980 64 (7

00000

62832

Secondly, I cancell the firſt cypher to the left hand, and place one cypher more towards the right hand, vnder the o, and then I point againe to the firſt cypher, and ſee how oft I may haue 8 in 86; I find 9 times, and placing

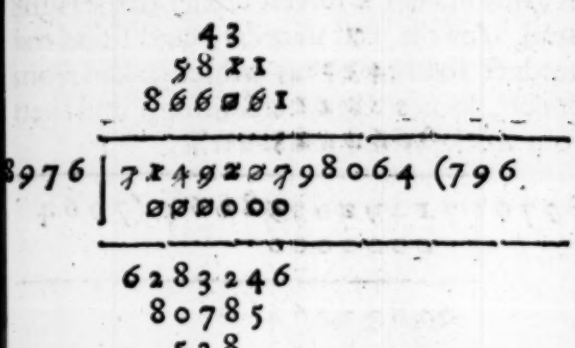
placing 9 in the Quotient, by it I multiplie 8976 my Diuisor, placing the lowest figure in value vnder the lowest cipher to the right hand, and the rest in order, and I find the product to bee 80784, which taken from 86600, leaues 5816 remaining, and then your worke will stand, as in this.

Example.

```
          581
         86606
        ------------------------------
8976 | 7149207980 64 (79
       00000
        ------------------------------
        628324
         8078
```

Thirdly, I cancell my Diuisor, or one Cypher, and place one cypher more vnder 7, and then seeke how oft I may haue 8 in 58, which I find 6 times, and by it I multiply my Diuisor 8976 makes 53856, which taken from 58167, leaues 4311, and the work will stand as followeth.

Example.



Fourthly, I cancell one cypher, and place a cypher vnder 9, and then ſeeke how oft I may haue 8 in 43, which I find but 4 times, which I place in the Quotient, and by it I multiply my Diuiſor 8976, makes 35904, which taken from 43119, leaues 7215.

Example.

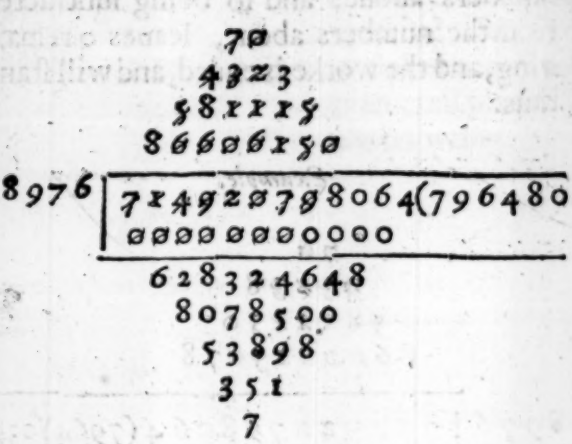
Example.

```
          7
         432
        58111
       8660615
      ---------------------------------
8976 | 71492079 8064 (7964
      0000000
      ---------------------------------
       62832464
        807850
         5389
          35
```

Fifthly, I cancell one cypher, and place a cypher vnder 8, and seeke how oft 8 is in 72; I find 8 times, which placed in the Quotient, I multiply my Diuisor 8976 by it makes 71808, which taken from 72158, leaues 350, and the worke stands, as in the example following.

Example.

Example.

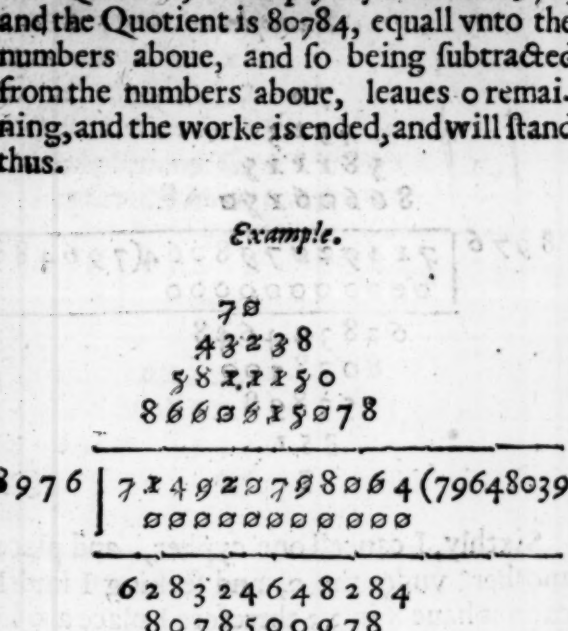


Sixthly, I cancell one cypher, and place another vnder the 0, and ſeeking I find I cannot haue 8 in 3; therefore I place a 0 in the Quotient. Seuenthly, I cancell one cypher, and place one other vnder the 6, and ſeeke how oft I may haue 8 in 35; I find but 3 times, and placing 3 in the Quotient, by it I multiply 8976, makes 26928, which taken from 35006, leaues remaining 8078.

Laſtly, I cancell the next cypher, and doe place another vnder the laſt figure of my Diuidend 4, and ſeeke how oft I may haue 8 in 80; I find 9 times, and then placing 9 in

the Quotient, I multiply my Diuiſor 8976, and the Quotient is 80784, equall vnto the numbers aboue, and ſo being ſubtracted from the numbers aboue, leaues o remaining, and the worke is ended, and will ſtand thus.

Example.



The proofe. 7 1 4 9 2 0 7 9 8 0 6 4

The proofe of this Diuiſion is made by Addition of the figures, vnder the line or Diuidend,

Example.

```
                    1
                 10124
               2836623
           160376505128
           702246519189 8
         1329180320424591        The Quotient.
```

Diuisor.	1440145144900842953 6 . . . .
179852	00000000000000000000(8007390214736 8

```
143881600
   1258964
     539556
     1618668
        359704
         179852
          719408
          1258964
            539556
            1079112
             1438816
```

The proofe 1440145144900842953 6 *by Addition.*

Place this Example after F 2.

Diuidend, for if they returne your former Diuidend, the worke is true wrought; or otherwise be sure some error is in your work, if there remaines any fraction after your worke is ended, then it is to bee added into the lower figures in their seuerall places, as shall appeare by examples following.

the Quotient, I multiply my Diuiſor 8976,

The proofe of this Diuiſion is made by Addition of the figures, vnder the line or Diuidend,

Diuidend, for if they returne your former Diuidend, the worke is true wrought; or otherwiſe be ſure ſome error is in your work, if there remaines any fraction after your worke is ended, then it is to bee added into the lower figures in their ſeuerall places, as ſhall appeare by examples following.

Here in this example following, working according to this latter forme of worke, there is aduantage to be taken; if the figures of the Quotient bee well noted, as here the fourth figure of the Quotient is 7, the Product of the Diuiſor multiplied by it is 1438816, and alſo the eleuenth figure of the Quotient is 7, ſo that comming to multiply the Diuiſor againe by that 7, I neede but take the Product of the firſt multiplication by 7, which is 1438816, and ſo place them in their ſeuerall places, as in the example, and ſo likewiſe there is 3 in the Quotient two times, ſo that for the latter multiplication, I take the firſt product 539556, and ſaue that labour of multiplication of the Diuiſor by 3 : and ſo of any other figure comming into the Quotient more times then once, as by the example before going will appeare.

Place the great example following, in this place.

Example

Example.

```
          775
         45549
        4244628
       118268737
       ---------------------------
7583 | 876593204 (115599
     | 000000000
       ---------------------------
        7583
         7583
         37915
          37915
           68247
            68247
```

The 876593204 Proofe.

Example.

```
356 | 7856792 (22069
    | 0000000
    ---------
      7122064
       71130
         232
    ---------
      7856792
```

How to diuide by a Vnite with Cyphers.

If you wil diuide by 10, or by 100, or 1000, or with any other vnite with cyphers, one or more ; doe but cut off ſo many figures from the right hand of your Diuidend, as there are cyphers in your Diuiſor, and the remaines is your Quotient.

Example.

If you would diuide 786589 by 10, cut off the laſt figure 9, and the reſidue is your Quotient 78658 $\frac{9}{10}$; or if you will diuide by 100, cut off two figures, and the Quoti-

ent

ent will be 7865 $\frac{12}{100}$; or by 1000, and the Quotient will be 786 $\frac{122}{1000}$; and ſo of all other.

Firſt.		*Second.*		*Third.*	
78658	9	7865	89	786	589
1 0		1 00		100	0

78658 $\frac{2}{10}$ 7865 $\frac{82}{100}$ 786 $\frac{122}{1000}$

If you will diuide the Product of 1999 ſquared; that is to ſay, multiplied in it ſelfe, which is 3996001 by 1999, for expedition of worke, after you haue found the firſt figure of the Quotient 1, and taken that out, I find the next figure will be 9, which taken out, the third and fourth figures are alſo found to be 9, and ſo you need not make multiplication for euery ſeuerall 9, but the firſt will ſerue for all, as in the example following.

Example.

```
          17
         1979
        1997990
        ---------
1999 | 3996001 (1999
     | 0000000
        ---------
        1999111
        179999
         1799
          17
```

The proofe of 3996001 *this Worke.*

Example.

Example.

```
                89
               9899
              998899
             99989999
          ------------------------
99999 | 9999800001 (99999
        00000
          ------------------------
          8999911111
           89999999
            899999
             8999
              89
          ------------------------
          9999800001   The Proofe.
          ------------------------
```

Briefe Rules by Multiplication and Diuision.

If you multiply any number of nines; as if you will multiply, or square 5 times 9 by 5 times 9, then place your nines in this order following.

Example

Example.

9999900000
99999

9999800001

Then say, 9 times 9 is 81, place the 1 vnder the first 9 to the right hand, and then subtract the 1 from the first 9 to the left hand, and adde the cyphers betweene, and the Product is ended, and is 9999800001, as appeareth.

The proofe of the worke after the ordinary way.

99999
99999

899991
899991
899991
899991
899991
899991

The proofe. 9999800001

To multiply any number by 9.

Adde a 0 to the number you intend to multiply, and then ſet the ſame numbers vnder them, and ſubtract them from the vppermoſt, and the remaines is the Product of that multiplication by 9.

Example.

87987960
87987960

The Product. 791891164

To multiply by $\frac{1}{2}$, or $\frac{1}{3}$, or $\frac{1}{4}$, or $\frac{1}{5}$.

If you will multiply 856 by $24\frac{1}{2}$, firſt, multiply 856 by 24, makes 20544; and then for one halfe, take halfe 856, which is 428, and adde into the former ſumme, makes the totall 20972.

Example.

Example.

856	856	856
24½	24⅓	24¼
3424	20544	20544
17128	285⅓	214
42		
20972	20829⅓	20758

What number is that, which being diuided by 24, the Quotient will be 856. Anſwer, multiply 856 by 24, makes 20544 for the number that you ſeeke.

Example.

856
24
3424
1712
20544

There

There is a plot of land containing 848 Perches, the one side is 24, what must the other be. Answere, Diuide 848 by 24, the Quotient is $35\frac{1}{3}$ for the other side.

```
 22                          35 1/3
848  35 1/24, 1/3            24
244                        ------
 2                          140
                            708
                           ------
                            848
```

If you will diuide the Product of 5 times 9 squared, which is 9999800001, by 5 nines, then set the Diuisor right vnderneath the Diuidend, and adde them together, and cut off the 5 cyphers from the Product, and the residue is the Quotient.

Example.

```
                9999800001
                     99999
-------------------------------
The Quotient.  99999|00000
```

What

What number is that, which being multiplyed by 15, the totall will be 756. Answ. diuide 756 by 15, and the Quotient is 50 $\frac{6}{15}$, or $\frac{2}{5}$, for the answer, or number you do seeke.

Example.

```
                          50 2/5
                          15
756 (50 6/15 2/5          ------
255                       250
 1                        506
                          ------
                          756
```

There are 825 men, to march 15 in one ranke, how many files will they make. Deuide 825 by 15, it makes 55 files.

Example.

```
                          55
  7                       15
825 (55 files.            ------
255                       275
 1                        55
                          ------
                          825
```

There

Diuiſion.

There is 948 pound of powder to bee imployed in an Aſſault of Battery with 6 pieces of Ordinance; the firſt piece ſhooteth 4 pound, the ſecond 5, the third 6, the fourth 7, the fifth 8, the ſixth 10 pound, the queſtion is, how many Shootes each piece may make, to make an equall number of Shotts. Anſwere; diuide 948 by 40, and it makes 23 Shootes, and there will remaine 28 pound.

Example.

4
5
6
7
8
10
40

22 *Shootes.*
948 (23.
440

23
40
920
28
948

Reducti-

THE RVLE OF REDVCTION.

TO reduce any great number into a ſmaller denomination, it is done by multiplication, and to reduce ſmall denominations into greater it is done by diuiſion: in this manner marke how many of the ſmaller denominations is contained in one of the next greater, and by that number you muſt multiply the greater: or of the contrary, if you would bring ſmall denominations into greater, marke how many of the ſmaller denominations makes one of the next greater, and that number ſhall be your diuiſor.

Example.

If you would reduce pounds ſtarling into pence, multiply your pounds by 240

pence, becauſe ſo many pence maketh pound ſtarling, and the totall will be the number of pence in the ſumme of pounds giuen. And contrariwiſe, if you would bring pence into pounds ſtarling: diuide your number of pence by 240 pence, which are the pence in one pound, and the Quotient will ſhew the number of pounds, in the ſumme of pence giuen: but in this operation the Tables in the beginning of this book will help much, for the ſpeedy reducing of pounds, ſhillings, pence, yards, ells, buſhels, pecks, pints, &c. into ſmaller or greater denominations; for if you ſearch in the ſaid Tables, you ſhal find your multiplier, or diuider, wherby you are to multiply, or diuide your number giuen, to performe the worke, as ſhall appeare by the ſeuerall examples following.

Reduction of Coyne.

In 87652 pound, how many pence: in the Table of Coyne I find 240 pence makes one pound, ſo that in multiplying 87652 pound by 240, makes the ſumme of pence deſired.

Example.

1. *Example.*

```
  87652
    240          11
-------         1852          l.
 3506080     21036480 (87652
175304         2444440
-------         2222
21036480 d.
```

2. *Example.*

In 3759 pound, 17 ſhillings, 8 pence, how many ſhillings, pence, and farthings.

l.			
3759	*q.*		
20	598		
75180	72744		*l.*
17	3609488	(3759	
75197 *s.*	966660		
12	999		
150402	*q.*		
75197	3		
902372 *d.*	362 *s.*		*d.*
4	848	(17	32 (8
3609488 *q.*	488		4
	4		

	l.	*s.*	*d.*
Proofe.	3756.	17.	8.

3. *Example.*

In 3785437289 farthings, how many pounds, ſhillings, and pence: diuide by 960 farthings, becauſe 960 farthings makes one pound ſtarling, & the remainer is farthings, which diuided by 48, the farthings in one ſhilling, makes 3943163 pound, 16 ſhillings 10 pence, $\frac{1}{4}$.

Example.

Example.

```
 431638
90105160                li.
785437289  (3943163
966666660             20
 999999
                  78863276 s.
 q.                     12
 4
321  s. d.        157726562
809(16.10¼        78863276
488
 4                946359322 pence.
                          4
```

The proof of the work. 3785437289

How to bring pounds, shillings, and pence at the first worke by Diuision.

To bring pence at the first worke into pounds, shillings, and pence: adde a 0 to your number of pence, and diuide that sum by 240, makes pounds, and the last figure will be primes, euery vnite in value 2 shillings, and the remainer alwaies lesse then 24 pence, or one prime.

Example.

In 902372 pence, how many pounds, shillings, and pence; adde a 0, makes 9023720, which diuided by 240 pence, makes &c.

```
 12  2d.  20d.
184210          l.  s   s.  d.
9023720 (3759.8.or 17.  8.
2444440
 2222              l.  s.  d.
                3759.  17.  8.
```

2. *Example*

2. Example.

In 75000837504 pence, how many pounds, ſhillings, and pence: adde a cypher, or 0.

```
  1     2210
 3620111340                    l. 1
 75000837504 0 (312503489. 6
 44444444440
 22222222
```

How to bring farthings into pounds, ſhillings, and pence at the firſt worke.

To bring farthings into pounds, ſhillings and pence at one worke: adde a 0 to your number of farthings, and diuide the ſumme by 960, the number of farthings in one pound ſterling, makes pounds; and the laſt figure of your Quotient will bee primes euery one in value 2 ſhillings: and if there remaine 48, it is one ſhilling, or take 48 from the remainer for one ſhilling, the reſt are farthings leſſe then 48.

Example.

l. s.d. q.

In 756. 13. 2. 2. how many farthings.

```
      20
-----------
   15133 s.
      12
-----------
  181598 d.
       4
-----------
  726394 q.
```

```
   665 q.
  54638        l. 1
 7263940 (756.6
  966660
   999
```

	l.	*s.*	*q.*		*s.*	*d.*	*ob.*
Totall is	756.	12.	58.	or	13.	2.	1.

In 3785437248 farthings, how many pounds, shillings, and pence, adde a 0, and diuide by 960, makes 3943163 pound, 8 primes, or 16 shillings, 0 pence.

```
   4316370
  90105166 0                l. 1
 37854372480 (3943163.  8
  966666666
   9999999
```

How

How to bring pence into pounds, ſhillings, and pence another way.

Diuide your number of pence by 4, and the remainer is pence, then that Quotient by 6, and the remainer is groats, alwaies leſſe then 6 groates, or one prime, or 2 ſhillings; and the latter Quotient, cutting off your Primes, is pounds, and ſo you haue pounds, ſhilling, and pence.

Example.

In 785697 pence, how many pounds, ſhillings, and pence, makes 3273 pound, 4 ſhillings, 9 pence.

3 2 1 6 1 1 d.	*1 4 2 4 2 groats.*	*l. 1*
7 8 5 6 9 7	(1 9 6 4 2 4	(3 2 7 3 | 7
4 4 4 4 4 4	6 6 6 6	

If you will bring farthings into pounds, ſhillings, and pence: diuide firſt by 16, and the remainer is farthings, alwaies leſſe then 16, or one groate; and then againe by 6, makes pounds, ſhillings, and pence, as before, cutting off the prime line.

Example.

Example.

In 8735672 farthings, how many pounds shillings, and pence.

Farthings.

2 2 *Groats.*

9 2 2 5 8 5 3 3 *l. 1*

8 7 3 5 6 7 2 (9 4 5 9 7 9 (9 0 9 9 |6

2 6 6 6 6 6 6 6 6 6 6 6

2 2 2 2 2

The totall is 9099 l. 13 s. 2 d.

Reduction of Waights.

In 8756 hundred, 3 quarters, 24 pound, 12 ounces Haberdepoyce, 16 ounces to the pound, and 112 pound to the hundred, how many pounds and ounces.

Example

Example.

C.	*quart.*	*l.*	*ounces.*
8756.	3.	24.	12.
112		28	16
		84	168

	980780
	16
17512	
87568	
87560	5884680
1	980780
	12

980780 *pounds.* *ounces.* 15692492

In 15692492 ounces Haberdepoyſe, how many hundreds, quarters, pounds, and ounces; finde how many ounces makes 112 pound, in multiplying 112 pound by 16 ounces, makes 1792 ounces; by which diuide, makes, as in the example following.

Example.

Example.

```
   117
  1024
 1386040    C.      112      l. oun.
15692492 (8756    1740 (108  12
 1792222           1666
  17999             11
   177
    1
```

	C.	qu.	l.	oun.
The proofe.	8756.	3.	24.	12.

Reduction of Measures.

In 2356 Acres, 3 Roodes, 27 Perches, how many Perches in all.

Example.

Example.

2356
160

	21		Per rood.
141360	594	acres.	2
235647	377207 (2356		247 (3
1	266666		40
	222		
377107			

	Acres.	Perches.	Roodes.
The Proofe.	2356.	3	27

In 765437 Perches, how many Acres, Roodes, and Perches: diuide by 160.

Example.

2	2		
2365	Acres.	3	roods. perch.
765437 (4783		257 (3	37
266666		40	
222			

Reduction of Time.

In 356 yeares, 24 dayes, 36 houres, and 22 minuts; how many dayes, houres and minutes.

Example.

```
          356
          365
        ------
         1780
        21364
       10682
      ------------------------------
       129964 daies.
           24
      ------------
       519856
      2599286
            3
      ------------------------------
      3119172  Houres.
           60
      ------------------------------
     187150320
           22  Minutes.
      ------------------------------
Totall of 187150342  Minutes.
```

The

The Proofe.

In 187150342 minuts, how many houres, dayes, yeares, and minutes.

Example.

Minutes.	*Houres.*	
151412	2211	
	733536	*Dayes.*
187150342	(3119172	(129964
66666660	2444444	
	22222	

Dayes.	
222	
2041	*Yeares.*
129964	(356
36555	
366	

	Yeares.	*Dayes.*	*Houres.*	*Minutes.*
The proofe is	356	24	36	22

Reduction

Reduction of Motion.

In 11 Signes, 34 degrees, 25 minutes, 36 seconds, 24 thirds; how many fourths.

Example.

Sign.	Degr.	Min.	Sec.	Thirds.		
11.	34.	25.	36.	24		11 Sig.
						30
				364	Deg.	
				60		330 deg.
						34
				21840	Min.	
				25		364
				21865	Minuts	
				60		
				1311900	Seconds	
				36		
				1311936	Seconds	
				60		
				78716160		
				24		
				78716184	Thirds.	
				60		
				4722971040	Fourths.	Product totall.

The

The proofe.

In 4722971040 fourths, how many signes degrees, minutes, seconds, thirds, & fourths.

Example.

Fourths.	*Thirds.*	
5403152	1 15232	*Seconds.*
4722971040	(78716184	(1311936
666666660	66666 0	

Seconds.	*Minuts.*	
153336	322	*Degrees.*
1311536	(21865	(364
666660	6660	

Degrees.	*Signes.*	*Deg.*	*Minut.*	*Seconds.*	*Thirds.*
364	(12.	4.	25.	56.	24.
330					

The proofe.

Questions by Reduction.

1. *Question.*

In 389 pound Starling, how many Dollars of 4 shillings 8 pence, or 14 groates a

piece. Reduce 389 pound into groats, in multiplying them by 60, makes 23340 groats; which diuide by 14 groats, makes 1667 pound, and 8 pence.

Example.

Groats.

l.	*x*			
389	9902	*l.*	*s.*	*d.*
60	23340 (1667.	0.	8.	
	x4444			
23340	*xxx*			

2. Queſtion.

In 300 pound ſtarling, how many Angels at a 11. ſhillings a piece Reduce 300 pound into ſhillings, makes 6000 ſhillings; which diuide by 11, makes 545 angels, and there will remaine 5 ſhillings.

Example.

Example.

l.	*s.*	
300	565	*angels.* *s.*
20	6000	(545. 5. *Rest.*
	x x x x	
6000	x x	

3. *Question.*

In 3012 pound, how many Ryals of plate at 7 pence a Ryall. Reduce 3012 pound into pence, makes 722880 pence; which diuided by 7, makes, as in the example.

l.	*Example.*		
3012			
240	*Pence.*		
	x464	*Ryalls.*	*d.*
120480	722880	(103268.	4.
6024	777777		
722880	*Pence.*		

4. *Question.*

If one Dollar be worth 4 shillings 8 pence,

how many Dollars is in 108579 pound, 16 ſhillings ſtarling. Multiply your pounds by 60, makes 6514740; then reduce 16 ſhillings into groates by 3, makes 48 groates; which added into one total, makes 6514788 which diuided by 14, makes, as in the example.

Example.

Pounds.

108579
60
6514740
48
Groats. 6514788

Shillings.

16
3
48

970520 *Dollars.*
6514788 (465342
444444
xxxxx

In 465342 Dollars of 14 groats a piece, how much ſtarling money: multiply your Dollars by 14, makes 6514788 groates; which diuide by 60, makes 108579 pound, 16 ſhillings.

Example.

Example.

465342		
14	*Groats.*	
	3454	*l. s.*
1861368	6514788	(108579.16
465342	6666660	
6514788		

5. *Questions.*

If I receiue 8060 French Crownes at 6 shillings a piece in France, how much Starling must I pay for them at 6 shillings, 1 penny a piece: multiply 8060 by 73 pence, the number of pence in one French crowne, makes 588380 pence: which diuided by 240 pence, makes 2451 pound, 11 shillings, 8 pence.

Example.

8060		
73	1	
	10214	*Pound.*
24180	588380	(2451.
56420	244440	
	222	
588380		

Pence.

28	*s.*	*d.*
140	(11.	8.
122		
1		

6. *Question.*

If 564 yards of cloth cost 124 pound, 12 shillings, how may I sell a yard to gaine 22 pound, 7 shillings, by the whole Summe. Answere, adde 22 pound, 7 shillings, to 124 pound, 12 shillings, makes 146 pound 19 shillings: which reduce into pence, makes 35268 pence: which diuided by 564, makes 5 *s.* 2 *d.* $\frac{1}{2}$ $\frac{6}{47}$ of a farthing for the price to sell one yard, for to gaine 22 pound 7 shillings by the bargaine.

Example.

Example.

l.	*s.*
124	12.
22.	7.
146.	19.

l.	*s.*
146.	19
	20
	2939
	12
	5878
	2939
	35268

3
80
2820 *d.*
35268 (62. $\frac{228}{564}$
5644
56

7. Question.

If 156 ells of cloth cost 124 pound, what will one ell cost. Reduce 124 pound into shillings, makes 2480 shillings; which divide by 156, makes 15 shillings, 4 pence $\frac{24}{156}$ *q.*

Example.

	1		
124	924	s.	
20	2480	(15	$\frac{142}{177}$ *of a ſhilling.*
	2566		
2480	25		

8. Queſtion.

If I ſell 342 yards of Veluet for 241 pound, 17 ſhillings, how doe I ſell one yard: reduce your 241 pound, 17 ſhillings, into ſhillings, makes 4837 ſhillings; which diuided by 342 yards, makes 14 ſhillings, 1 penny, $\frac{41}{57}$ of a penny.

Example

Example.

l. *s.*		49
241. 17	4	12
20	1419 *s.*	
	4837 (14 $\frac{49}{342}$	98
4837	3422	49
	34	
		588

246 *d.* *s. d.*
588 (1 $\frac{43}{57}$ of a penny, makes 14. 1. $\frac{43}{57}$ *d.*
342

9. *Question.*

A certaine Nobleman sent his seruant to the Tower of London, with the Kings Maiesties Warrant to the Mint-master for 3408 pound, 15 shillings, willing him to bring it in pieces of 12 *d.* of 9 *d.* of 6 *d.* of 3 *d.* of 2 *d.* of 1 *d.* of 1 *ob.* commanding him to bring him of each sort a like quantity, or number of pieces; the question is to know, how many of each sort hee shall bring vnto his master, to make the said sum of 3408 *li.* 15 *s.* reduce your mony into half pence, and also your seueral pieces of Coyne into half pence,

pence, and diuide the greater by the lesser, as in the example.

Example.

l.	s.
3408.	15
	20
68175	
	24
272700	
136350	
1636200	

	12 d.
	9
	6
	3
	2
	1 ob.
	67

22
29846 *Pieces.*
1636200 (24420 $\frac{40}{67}$
677777
6666

1. What

What Progreſsion Arithmaticall is, and the Rule.

PRogreſsion Arithmeticall is nothing elſe but a briefe ſumming, colecting, or gathering together of diuers numbers, increaſing by equall proportion, into one totall ſumme. As for example: 1.2.3.4.5.6.7.8.9.10.&c. or alſo, 3.4.5.6 7.8.&c. or, 2.4 6.8.10,12.&c. or elſe by 3,as, 5.8.11.14 17.20.23.26 &c. or of all ſuch like kinds of Progriſsion, which doe increaſe equally by 2.3.4.5, or 6, or any other greater increaſe, and ſuch kind of Progreſsion is called, Arithmeticall.

2. *To find the ſumme of a Progreſsion.*

Marke firſt how many ſeuerall places there be in your Progreſsion, and note that downe; then adde the firſt number of the Progreſsion to the laſt: then multiply haife thoſe two numbers by the whole number of the places, or elſe halfe the number of the places, by the whole number of the firſt and laſt terme added into one ſumme, and both waies

waies will produce the totall ſumme of that Progreſsion.

Example.

There is a Progreſsion beginning at 4, and is continued vnto 44, increaſing by 4. Firſt, ſet downe the numbers of that Progreſsion, beginning at 4, and ending at 44.

Termes. 4.8.12.16.20.24.28.32.36.40.44.
Places. 1.2. 3. 4. 5. 6. 7. 8. 9.10.11.

Here the firſt terme is 4, and the laſt is terme is 44, which added together, makes 48, the one halfe, which is 24, multiplied by 11, the whole number of places makes 264 the totall.

Example

Example.

44		44
4		4
48	481	48
11	52	11
48	240	24
48	241	24
258	264	24
264		264

First Question.

A certaine man gaue to his daughter in marriage the first day of Ianuary 1 pound, and the second day 2 pound, the third day 3 pound, and so increasing euery day 1 pound, vntill 31 dayes were expired; the question is, what he should receiue in the whole sum. First, 31 dayes is the number of places, and 31 *li.* is the last payment: adde the first terme 1 to the last terme 31, makes 32; which multiplied by 15 one halfe, which is halfe 31; or take

take 31 and halfe 32, and the product wilbe the totall Summe of his wiues portion.

Example.

32	
15 ½	31
	16
480	l.
16	186 makes 496 *totall.*
	31
496	
	496

How to find the latter terme of a Progreſsion.

If you would know the latter terme of a Progreſsion of 100 termes, increaſing by 3, and beginning at 10; take one terme from 100 termes, & there will remaine 99: which multiply by 3, the exceſſe or difference of the increaſe, makes 297; to the which if you adde the firſt terme 10, makes 307 for the 100 terme of that Progreſsion.

Example.

Example.

100 *termes.*	99 *termes.*
1 *Subtract.*	3 *Exceſſe.*
99	297
	10 *firſt terme.*
	307

Or otherwiſe take the Exceſſe 3 from the firſt terme 10, and there will reſt 7, which note a part, then multiply, the number of places 100 by the exceſſe 3, makes 300; to which adde the 7, makes 307, as before.

Example.

10	103
3	3
7	307

Second Queſtion.

A certaine Merchant bought 78 pieces of Exctor Carſies, to pay 2 ſhillings for the firſt

firſt piece 4 ſhillings, for the ſecond 6 ſhilling, for the third, 8 s. & ſo forth increaſing his price vnto 78 pieces, 2 ſhillings in euery piece; the queſtion is, what the Clothier had for his Carſeys.

Firſt, find the latter terme, taking one from 78, makes 77; which multiply by 2, makes 154; to which adde the firſt terme 2, makes 156 for the 78, or laſt terme: then adde 2, the firſt terme, to 156, the laſt, makes 158; which multiply by 39, half of the number of places, makes 6162 ſhillings for the ſumme of money, the Clothier ſhall receiue for his 78 Carſeys.

Example.

78
1
77
2
156 *the laſt terme.*

156
2
158
39
1422
474
6162 s.
or 308 l. 2 s.

To

To find the number of termes.

There is a Progreſsion, whoſe firſt terme is 2, the laſt terme, 156, and the exceſſe was 2, I would find the number of termes:

Subtract the firſt terme from the laſt, and diuide the remayner by the exceſſe, the quotient is the number of termes, wanting but one. Example: 2, the firſt terme from 156, the laſt leaues 154; which diuided by 2, makes 77; to which adde 1, makes 78, the number of termes.

156	154 (77		
2	22	1	*The number of Termes.*
154	78		

How to find the Exceſſe, or difference.

Subtract the firſt terme from the laſt, and diuide the remainer by one leſſe, then the number of the Termes, and the Quotient will be the Exceſſe or difference.

firſt piece 4 ſhillings, for the ſecond 6 ſhilling, for the third, 8 *s.* & ſo forth increaſing his price vnto 78 pieces, 2 ſhillings in euery piece; the queſtion is, what the Clothier had for his Carſeys.

Firſt, find the latter terme, taking one from 78, makes 77; which multiply by 2, makes 154; to which adde the firſt terme 2, makes 156 for the 78, or laſt terme: then adde 2, the firſt terme, to 156, the laſt, makes 158; which multiply by 39, half of the number of places, makes 6162 ſhillings for the ſumme of money, the Clothier ſhall receiue for his 78 Carſeys.

Example.

78
1
77
2
156 *the laſt terme.*

156
2
158
39
1422
474
6162 *s.*
or 308 *l.* 2 *s.*

To

To find the number of termes.

There is a Progreſsion, whoſe firſt terme is 2, the laſt terme, 156, and the exceſſe was 2, I would find the number of termes:

Subtract the firſt terme from the laſt, and diuide the remayner by the exceſſe, the quotient is the number of termes, wanting but one. Example: 2, the firſt terme from 156, the laſt leaues 154; which diuided by 2, makes 77; to which adde 1, makes 78, the number of termes.

156	2	154 (77	
2		22 1	*The number of Termes.*
154		78	

How to find the Exceſſe, or difference.

Subtract the firſt terme from the laſt, and diuide the remainer by one leſſe, then the number of the Termes, and the Quotient will be the Exceſſe or difference.

Example.

Subtract 10, the firſt terme, from 307 the laſt terme, there will remaine 297; which diuide by 99, one leſſe then the number of termes, which are 100, makes 3 the exceſſe.

307	00
10	297 (3 *the Exceſſe.*
297	99

To find any middle terme.

Subtract a vnite from the number of the terme you would know, and multiply the remainer by the difference, and to that product adde the firſt terme, and the totall is the terme you doe ſeeke.

Example.

To find the 30 terme in the laſt example of 100 termes, ſubtract 1, reſts 29; which multiply by 3, the Exceſſe makes 87; to which adde the firſt terme 10, makes 97 for the 30 terme of that Progreſsion.

Example.

Example.

30	1	10	11	40	21	70
1	2	13	12	43	22	73
29	3	16	13	46	23	76
3	4	19	14	49	24	79
87	5	22	15	52	25	82
10	6	25	16	55	26	85
97	7	28	17	58	27	88
	8	31	18	61	28	91
	9	34	19	64	29	94
	10	37	20	67	30	97

How to find what number ſhall begin and finiſh a Progreſsion.

To the number of termes adde one, which multiply by halfe the number of termes, and by the product diuide the ſum of the progreſsion, and the quotient will be the firſt terme, and exceſſe of that progreſsion.

Example.

At 16 payments 353 pound, 12 ſhillings is to be paid, the queſtion is, what number muſt begin, and continue the progreſsion.

Firſt, the money 7072 ſhillings; then to 16, the number of termes, adde 1, makes 17; which multiply by 8, halfe the number of termes, makes 136 for Diuiſor; by which diuide 7072, and the quotient is 52 ſhillings for the firſt paiment and exceſſe, and by the ſame the other payments are found.

Example.

l.	*s.*				
353.	12	*x*	*s.*		17
20		7072 (52			8
		x366			
7072		x3			136

Example.

Example.

	Nu.			*Nu.*
52	1	*The Proofe.*	468	9
104	2		520	10
156	3	1872	572	11
208	4	5200	624	12
260	5		676	13
312	6	7072 *s.*	728	14
364	7		780	15
416	8		832	16
1872			5200	

What Geometricall Progreſsion is, and the Rule.

THe termes being 3, to find a third proportionall betweene two extreames: diuide the Roote of the greater by the leſſer extreame, and the quotient is your deſire.

Example.

Firſt, 8 and 12 are two extreames giuen, it is required to find a proportionall number

betweene thoſe two numbers giuen; ſquare 12, it is 144, which diuide by 8, makes 18 for the third proportionall number. Secondly, multiply your extreames together, and extract the ſquare roote for the meane proportionall, betweene two numbers giuen; as let 4 and 9 bee two extreames, 4 by 9 is 36, the ſquare roote is 6, for a meane proportionall number to thoſe two numbers giuen.

Betweene 2 and 54, let 2 meane proportionals be deſired by the ſquare of 2, which is 4; multiply 54, it makes 216, the Cube roote whereof is 6 for the leaſt of the two Meanes: Againe, by 2 multiply 2916, which is the ſquare of 54, makes 5832, of which the Cube roote is 18, for the greater meane proportionall ſought. But if the termes exceede 4, hauing all one exceſſe, it is then called Geometricall Progreſsion.

To find any middle Terme, or any other Terme in a Geometricall Progreſsion.

Increaſe your Progreſsion by the exceſſe, and the ſquare of the terme when you ceaſe, or the number multiplied in it ſelfe ſquarely, is the double of your Terme ſaue 1, if the

progreſ-

progreſsion begin with an vnite.

But if the firſt terme be not an vnite, then the ſquare of any terme is the double number of the ſaid terme: as if you ſhould ſquare the fixth terme, then the product would bee the twelfth terme: & ſo of any other terme.

Example.

A Gentleman comming into a Market to buy a Horſe, was asked 30 pounds for him. Nay (ſaid the Gentleman) his price is ouer great. Then ſaid the owner (hauing more craft and ſubteltie then the Gentleman, as commonly the old Prouerb is true amongſt Horſe-courſers); My Gelding hath fower ſhooes vpon his fower feete (quoth he), you ſhall giue me for the firſt nayle (there being 28 in all) one farthing, and for the ſecond nayle 2 farthings, and for the third 4 farthings, and for the fourth 8 farthings; and ſo double at euery nayle, you ſhall haue him. Whereat the Gentleman ſmiled, ſaying; I will haue him. And ſo they bargained, and then went to an Arithmatician to caſt vp the Summe: but how this Gentleman was able to pay for this Horſe, ſhall appeare by the Worke, which I haue put for an exam-

ple, becauſe I would not haue any man ignorant in Arithmatick, to make any ſuch blind matches without aduice, as I know many haue done to their coſt.

1. Example.

Now according to the rule, I increaſe this progreſsion vnto the ſeuenth Terme thus, 1.2.4.8.16.32.64; which 64 I multiply by it ſelfe ſquarely, the product is 4096, which by the rule is the thirteenth Terme, which is one Terme leſſe then the double of 7; then multiply that 4096 by 2, it makes 8192, which is the fourteenth Terme. Then multiply 8192 by 8192, and the product is 67108864, which is the twentie ſeuenth Terme: the which being doubled, makes the laſt Terme 134217728.

Example.

```
                    8192
   64               8192
   64          ------------
 ----              16384
  256             73728
 384               8192
 ----           65536
 4096          ------------
    2           67108864
 ----                  2
 8192          ------------
                134217728
```

The Extreames and Exceſſe of a Progreſsion giuen to find the ſumme.

Multiply the laſt terme by the Exceſſe, and from the Product abate the firſt terme, and diuide the remayner by a vnite leſſe then the exceſſe, and the Quotient is the ſumme of the Progreſsion deſired.

Example.

Example.

In the laſt examples, the exceſſe was 2, by which I multiply 134217728, and the Product is 268435456, from which abate 1, the firſt terme, and the remayner is 268435455, which ſhould bee diuided by one vnite leſſe then the exceſſe, which is 2, and 1 leſſe is but 1; therefore ſeeing 1 doth neither multiply, nor diuide, I conclude the price of the horſe to be 268435455 farthings; which I diuide by 960, the farthings in one pound ſtarling, and the quotient is 279620 pound, 5 ſhillings, 3 pence, 3 farthings, the price of the Horſe, as in this example.

Example.

Example.

1 3 4 2 1 7 7 2 8

2

2 6 8 4 3 5 4 5 6

1 *farthing.*

2 6 8 4 3 5 4 5 5

Farthings.

9 5 2

7 6 2 9 9 2 6 3 *l.* 1

2 6 8 4 3 5 4 5 5 0 (2 7 9 6 2 0. 2.

9 6 6 6 6 6 6 6 2

9 9 9 9 9 9

	l.	*s.*	*d.*	*q.*
Totall.	279620.	5.	3.	3.

I haue inſerted in the next page the triall of this work, by increaſing the Termes from 1 to 28, and alſo the Addition of the totall, which ſhewes the anſwere to be true.

Example.

Example.

1	1
2	2
4	3
8	4
16	5
32	6
64	7
128	8
256	9
512	10
1024	11
2048	12
4096	13
8192	14
16384	15
32768	16
65536	17
131072	18
262144	19
524288	20
1048576	21
2097152	22
4194304	23
8388608	24
16777216	25
33554432	26
67108864	27
134217728	28
268435455	*The Total.*

Other-

Otherwiſe, ſubtract the firſt terme from the laſt, and diuide the remayner by one ace leſſe then the Exceſſe, and to the quotient adde the laſt Terme, and the totall is the ſumme.

Example.

To 12 men a ſumme of money is giuen, to the eldeſt $\frac{1}{2}$, to the ſecond $\frac{1}{2}$, the remayner, and ſo to euery one of the reſt, and the laſt portion was found to bee 4 pound, and the laſt halfe being alſo 4 pound, was giuen to a friend to ſee the money to bee equally diſtributed; what was each mans portion, and the ſumme giuen?

Let 4 bee the laſt portion, and twelfth Terme, and ſo double vntill you come to the firſt terme, and you ſhall find euery mans portion. Then by this ſecond rule, you ſhal find the totall to be 16380 pound; to which adde the Executors part 4 pound, makes 16384 pound.

3. *Example.*

A Gentleman bought a Mannor, with all the appurtenances for a ſumme of money vnknowne; but hee was to pay at ſeuerall daies

dayes of payment by continuall triplation, of euery payment, from the first payment which was 4 pound, and the last 8748 *li.* the question is, what he paid for the said Mannor and lands.

Example.

Subtract the first terme 4, from the last terme 8748, there will remaine 8744; which diuide by the Excesse, one lesse, *viz* by 2, and the quotient will bee 4372; to the which adde the latter terme 8748, and the totall is 13120 pound, for the summe which the said Mannor and lands cost.

```
   8748        1
      4      8744 (4372
 ------      2222  8748
   8744            -----
                   13120
```

Fractions

Fractions.

YOu ſhall vnderſtand, that in the worke of Fractions hereafter; in the next page following I haue vſed another forme of working, then heretofore hath been vſed: as when you will ſet forth any fraction, as $\frac{3}{4}$ thus heretofore vſed, ſet thē out thus, 3:4; or $\frac{7}{8}$, place thus 7:8 with a double prick betweene them: and ſo of any other, as $\frac{15}{20}$ of a pound, thus, 15:20 of one pound: or fractions of fractions, thus, $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$ of a pound, ſet them thus, 2:3 of 3:4 of 5:6 of a pound: and ſo of all other fractions, as ſhall appeare afterward in the operations following; and ſo being placed, they are more apter and fitter for al the ſeuerall operations of Arithmatick, then being placed after the ordinary forme of working. And thus much I thought good to expreſſe for the better vnderſtanding of the Rules hereafter following, in all fractionall operations: And now I will proceede vnto the ſeuerall rules of Fractions, with their Examples.

How to reduce Fractions of Fractions.

First Rule.

Multiply their topps one into another for a new numerator, and likewiſe their Baſſes for a new denominator, and the worke is ended.

Example.

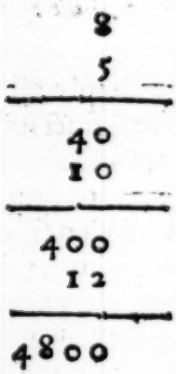
If you would reduce 3:4 of 2:3 of 7:8 of one *li.* ſtarling; multiply 3 by 2, makes 6, and then 6 by 7 makes 42 for the new numerator to your fraction: then 4 by 3 makes 12, and 12 by 8 makes 96 for new denominator, and the fraction is 42:96 of a pound.

3:4 of 2:3 of 7:8 of 1 *li.* makes 42:96 of a *li.*

2. *Example.*

Againe, 3:5 of 9:8 of 7:10 of 11:12 of a pound, makes 2079:4800.

3. *Example.*



3. *Example.*

What is 1:2 of 2:3 of 3:4 of 4:5 of 5:6 of 6:7 of one pound. Answer: crosse al the byas equall termes, and set the vnequall termes 1:7 of a pound for the totall summe: but after the other forme of worke, it would haue brought out 72015040 of a pound, which by abreuiation makes 1:7

The Proofe.

72:504, 36:252, 18:126, 9:63, 3:21, 1:7.

2. *Rule: How to reduce Fractions of Integers.*

Multiply all the Denominators of your ſeuerall fractions for the new, or common Denominator to all your giuen fractions.

Then to find new numerators to each of your giuen fractions; multiply each fractions top into the baſſes, of each ſeuerall fraction, excepting his owne baſſe, for the new numerators, as in this Example.

Example.

If you would reduce 3:4 and 5:6 and 7:8 of a pound into one Denomination: multiply all the baſſes together, ſaying; 4 by 6 makes 24, and 24 by 8 makes 192 for the common Denominator to all the giuen fractions.

Then multiply 3, the numerator of the firſt fraction, by 6, the denominator of the ſecond fraction, makes 18, & 18 by 8 makes 144 for his numerator.

Secondly, multiply 5, the numerator of the ſecond fraction by 4 and 8, the Denominators of the other two fractions, makes 160 for the new Numerator of the ſecond fraction.

Thirdly,

Thirdly, multiply 7, the numerator of the third fraction, by 6 and 4, makes 168.

Example.

	N.D.	18	20	42	144
144.	3:4	8	8	4	160
160.	5:6				168
168.	7:8	144	160	168	
	192	*The totall*, 472:192.			472

2. *Example.*

If you would reduce 2:3, and 3:5, and 8:9 of a pound.

	N.D.		*N.D.*	
90.	2:3		7:10	1365
81.	3:5	Also,	10:15	1300
120.	8:9		11:13	1610
135.				1950

3. Example.

If you would reduce 7:8, 1:3, 2:3, 4:5, and 6:7 of a pound.

	N.D.			
2205.	7:8			
840.	1:3	40.	1:2	40
1680.	2:3	70.	7:8	70.
2016.	4:5	48.	3:5	48
2160.	6:7			
			80	158
2520				

How to proue a Fraction by the knowne parts of Coyne.

In the first example of fractions of fractions, I find that 3:4 of 2:3 of 7:8 of a pound Sterling to bee 42:96 parts of a pound: for triall whereof, take 7:8 of a pound, which is 17 shillings 6 pence, or 210 pence, the 2:3 of that number is 140 pence; and 3:4 of 140 pence is 105 pence: now multiply 42 the numerator of your fraction by 240 *d.* and diuide by 96, the denominator, makes 105 pence, the proofe, as followeth.

4. Example.

4. Example.

l.	*s.*	*d.*
17.	6	
12		
34		
176		
210		

210 (70
33 2
140

d.
140
70
35
105 *d.*

42
240
1680
84
10080

40
10080 (105 *d.*
9660
99

2. Example.

In the first example of fractions of integers, there was 3:4, 5:6 and 7:8 of a pound, reduced into one denomination, and the totall by Addition was 472:192 of a pound. Now for the proofe of the worke, multiply the numerator 472 by 240, makes 113280;

which diuided by 192 the denominator, makes 590 pence; which diuided by 12 pence, makes 2 pound, 9 ſhillings, 2 pence. The proofe of this triall in the parts of a pound, take firſt for 3:4 of a pound, or 15 ſhillings; then 5:6 of a pound is 16 ſhillings 8 pence; alſo 7:8 of a pound is 17 ſhillings 6 pence; and the totall added together, is 2 pound, 9 ſhillings, 2 pence, which prooues the worke to be true.

Example.

```
   472
   240
-------
 18880
 944
-------
113280
```

```
     0
   1720
113280 (590
   1922
     19
```

```
   d.
  112      s. d.
  590 (49. 2.
  122
    1
```

```
   15. 0
   16. 8
   17. 6
-------
2.  9. 2
```

3. *Rule.*

3. *Rule. Addition in Fractions.*

If your fractions be of one denomination, then adde all your numerators together, subscribing the common denominator vnder the line.

Example.

2:4	3:12	32:8
5:4	8:12	17:8
3:4	11:12	13:8
7:4		
17:4	22:12	62:8

The second Rule.

If your Fractions be not of one denomition, then reduce them by the second rule of Reduction to one denomination, and then adde them into one summe subscribing vnder the common denominator.

Example.

40.	2:3	1440.	24:12
45.	3:4	836.	13:10
48.	4:5	2040.	17: 6
133	60	4316	720

If you would adde 40:80, 30:200, and 50:90; cut off a cypher from each numerator and denominator, and the fractions remaining will be of the same with the giuen fractions, and then worke as before.

Example.

720.	4:8	48.	30:44
216.	3:20	192.	60:20
800.	5:9	56.	70:80
1736.	1440	296	64

The

The proofe of Addition by parts of Coyne.

In the ſecond Example, 2:3, 3:4, and 4:5 of a pound, are found to be 133:60; therfore diuide 133 by 60, makes 2 pound and 13:60 or 13 groats remaining, which is 2 pound, 4 ſhillings, 4 pence.

The proofe: adde 2:3 of a pound, which is 13 ſhillings, 4 pence; and 3:4 of a pound, which is 15 ſhillings, and 4:5 of a pound, which is 16 ſhillings, into one totall, makes 2 pound, 4 ſhillings, 4 pence, as before.

Example.

Groat.						
1	*l.*	*s.*	*d.*		*s.*	*d.*
133	(2.	4.	4.		13.	4
60					15.	0
					16.	0
				l.		
				2.	4.	4

Rule 4. Subtraction in fractions.

As before in Addition, ſo alſo in Subtraction, reduce your fractions to one common denomination, then ſubtract the ſmaller numerator from the greater, and ſubſcribe the common denominator vnder the remainer.

1. Example.

If you will ſubtract 3:4 from 7:4, there will remaine 4:4, or one integer.

Alſo, 7:12 from 13:12, leaues 6:12, or 1:2 remaining. But if you will ſubtract 2:3 from 7:8, then reduce them to one denomination, by the ſecond rule of Reduction, and worke, as in this example.

Example.

3:4	7:12	16.	2:3
7:4	13:12	21.	7:8
4:4	6:12		5:24

2. Example

2. Example.

Againe, 3:8 from 15:16, leaues 72:128, remaines.

120.	15:16
48.	3: 8
72:	128

The proofe of Subtraction by the parts of Coyne.

In the example before, where I take 2:3 from 7:8, the remayner was 5:24 of a pound, which is 5 times 10 pence, or 4 shillings 2 pence. Also for proofe, take 13 shillings 4 pence, which is 2:3 of a pound, from 7:8, which is 17 shillings 6 pence, there will remaine 4 shillings 2 pence, as before.

Rule 5. Multiplication in Fractions.

Multiply Numerator by Numerator, and Denominator by Denominator, to make the new Numerator, and new Denominator, and the worke is ended.

1. Example.

1. Example.

If you will multiply 2:3, by 3:4, the product of that multiplication will be 6:12, or 1:2

6	15	2520	
2:3	5:7	35 : 60	
3:4	3 : 4	72 : 120	
12	28	7200	or 252:720

The proofe of Multiplication by the parts of Coyne.

In the first example, 2:3 is multiplied by 3:4, and the product makes 6:12 of a pound or 10 shillings: for proofe whereof, multiply 13 shillings 4 pence, or 160 pence, which is 2:3 of a pound by 15 shillings, or 180 pence, which is 3:4 of a pound, and the product will be 28800, which being diuided by 240 pence, the pence in one pound will yeeld in the quotient 120 pence, or 10 shillings.

Example.

Example.

l.	*d.*			
13.	4	15		180
12		12		160
26		30		10800
134		15		180
160		180		28800

	d.	*l.*
40		
28800	(120	120 (10
24440		xxx
22		x

6. Rule. Diuiſion in Fractions.

Multiply the numerator of the diuidend by the denominator of the diuiſor for a new numerator; and ſecondly the denominator of the diuidend by the numerator of the diuiſor, for new denominator, and the diuiſion is ended: or otherwiſe place your diuidend firſt aboue, and the diuiſor vnderneath, after any manner, and multiply croſſe, and place them as in theſe examples.

If

If you will diuide 6:12 by 2:3, which was the product of 2:3 by 3:4 in the last example, then it will bring out 18:24, or 3:4, the other number, which proones the worke good.

1. Example.

18	10	360
6:12	2:3	12:15
2: 3	4:5	24:30
24	12	240

If the denominators of the fractions bee both alike, then diuide their numerators one by another; as 27:32 diuided by 3:3, makes the quotient to be 9:32, or Integers.

Example.

9	3	3
27:32	9:8	21:24
3:32	3:8	7:24
32	8	12

If the numerators bee alike, then set the denominator of the diuisor aboue, the denominator of the diuidend, as 3:4 by 3:8, makes the quotient 8:4, or two Integers, and

and contrariwiſe 3:8 by 3:4, makes the quotient 4:8, or 1:2

Example.

8	4	24
3:4	3:8	7:16
3:8	3:4	7:24
4	8	16

The proofe of Diuiſion by the parts of Coyne.

In the ſecond of the firſt example, where I diuide 2:3 by 4:5, the quotient is 10:12, which in coyne is 16 ſhillings 8 pence: for proofe, I do multiply 2:3 of a pound, which is 160 pence, by 240, makes 38400, which diuide by 4:5, or 192 pence, makes 200 pence, which is 16 ſhillings 8 pence, the proofe.

Example.

Example.

	s. *d.*		*s.*	160
2:3	13. 4	4:5	16	240
	12		12	
	160		192	6400
				320
				38400

	d.		
38400	(200	88	*s.* *d.*
29222		200	(16. 8
299		222	
2		2	

7. Rule. How to worke whole numbers with Fractions.

If you would adde, ſubtract, multiply, or diuide whole numbers with fractions, ſet the whole numbers fraction wiſe, and put 1 after for denominator, and then worke as in the Rules before, as if they were all fractions, and no whole numbers.

Example.

Example.

If you will addo 33:1 with 13:4, multiply the numerator 33 of your whole number, by the Denominator of your fraction 4, makes 132:4, which adde vnto 13:4, makes the totall 145:4

132.	33:1		896.	128:1	
Ad. 13.	13:4		36.	36:7	
145 :	4		932 :	7	

2. *Example.*

If you will subtract 13:4 from 33:1, reduce them, and subtract 13 from 132, reſt 119:4

132.	33:1		896.	128:1	
Sub. 13.	13:4		36.	36:7	
119 :	4		860 :	7	

Example.

If you will multiply 33:1 by 13:4, multiply the numerators, 33 by 13, makes 429; to the which subscribe the Denominator 4, makes 429:4

33:1	128:1
13:4	36:7
492:4	4608:7

4. *Example.*

If you will diuide 33:1 by 13:4, multiply crosse 33 by 4, makes 132, to be set aboue; then 13 by 1 makes 13 for denominator.

132	108	896
33 : 1	27 : 1	128 : 1
13 : 4	32 : 4	36 : 7
13	32	36

8. *Rule.*

8. *Rule. How to worke whole numbers and fractions with fractions.*

Reduce your whole numbers into fractions in multiplying your whole number by the denominator of your fraction; and vnto that product adde the numerator of your fraction, and ſubſcribe the old denomination.

1. *Example.*

If you will multiply 28 3:4 by 3:5 reduce 28 3:4 into fourths in multiplying by the fractions denominator 4, ſaying, 28 by 4 makes 112, to the which adde the numerator of your fraction 3, makes 115; which multiplied by 3:5, makes 345:20

28.	3:4		115:4
4			3:5
115	: 4		345:20

If you will diuide 28 3:4 by 3:5; reduce them as before, and then multiply them croſſe, makes 115:4 by 3:5, is 575:12

Example.

575
225:4
3:9

12

9. Rule. How to Abreuiate a fraction.

Take one halfe of the numerator, and 1:2 of the denominator, as oft as you may vntill the loweſt numbers in valew of your fractions comes to be primes together, which are ſuch numbers, as cannot be abreuiated no lower.

Example.

In the firſt example of fractions of fractions, the fraction was 72:504, which was abreuiated vnto 1:7 of a pound: firſt, take halfe the numerator 72, which is 36, then halfe the Denominator 504, which is 252; then 1:2 of 36, is 18; and 1:2 of 252 is 126. Againe, 1:2 of 18 is 9, and 1:2 of 126 is 63; then I ſee I cannot take 1:2 of the remainer, wherefore I ſee I may abreuiate them by 3 ſtill,

ſtill, ſaying, the third part of 9 is 3, and 1:3 of 63 is 21 : laſtly, 1:3 of 3 is 1, and 1:3 of 21 is 7, which place thus, 1:7 ; ſo that I find by abreuiation that 72:504 of a pound, is one ſeuenth part of a pound.

Example.

72:504 36:252 18:126 9:63 3:21 1:7

If you cannot take halfe the numbers, then mark whether they wil abreuiate by 3 4, or 5, or any other number vnder 9; as for example, I would abreuiate 92:144, I ſee I may abreuiate both by 4; then taking 92, diuide by 4, makes 23, and 144 by 4 makes 36, totall 23:36 &c.

If you will abreuiate, 375:625 of a pound, you may eaſily ſee, they wil be both abreuiated by 5: wherefore diuide the numerator and denominator both by 5, as oft as you can, vntill they become primes together, and you ſhall find the value of that fraction to be 3:5 of one pound, or 12 ſhillings.

Example.

2 2 2
375(75 625(125 75(15 225(25 3:5
55 555 55 55

10. *Rule. How to find the value of any Fraction.*

Multiply the numerator of your fraction by the parts contained in the whole, and diuide that product by the old Basse, and the quotient will bee the value of that fraction in the knowne parts of Coyne.

Example.

If you would know what 24:32 parts of a pound is in Coyne: multiply your numerator 24 by 240, the pence in one pound, makes 5760; which diuided by 32, the denominator, makes 180 pence, or 15 shillings, the true value of that fraction.

Example.

Example.

24					
240	29	*d.*	6	*s.*	
960	5760	(180	280	(15	
48	3222		222		
5760	33		2		

What is 343:522 parts of a yard, multiply 343 by 16, the number of nayles in one yard makes 5448; which diuide by 522, makes 10 nayles, and 268:522 parts of a nayle.

Example.

343	26	*Nayles.*	
16	5488	(10	268:522
5488	5222		
	52		

11. *Rule. How to change the Sirname of a Fraction.*

Multiply the numerator of your fraction by the parts, or new Sirname of that you would change your fraction into, and diuide

by your denominator, and the quotient will be your desire.

1. *Example.*

I haue 324:1620 parts of a yeare, which I would conuert into dayes; I multiply 324 by 365, the number of dayes in one yeare, makes 118260; which diuided by 1620, makes 73 dayes, the value of that fraction.

Example.

```
   324
   365
 ------
  1620
 1944
 972
 ------
118260
```

```
  480 Dayes.
118260 (73
 16220
  16
```

I would change 256:5292 parts of a pound into pence; multiply the numerator 756 by 240 pence, makes 181440, which diuide by the denominator 5292, and the quotient is 34 pence 1512:5292

Example.

Example.

```
  756
   240        151
-------      22682   d.
 30240     181440 (34  1512:5292
 1512       52922
-------       529
 181440
```

12. *Rule.* *Questions of Fractions.*

What number is that to the which if you doe adde 3:4, the totall will bee 5:6 of a pound. Answere; reduce them to one denomination, and they are for 3:4 of a pound 18:24, and the 5:6 are 20:24, from which subtract 18, rest 2:24 of a pound, or 20 pence: the proofe, take 3:4 of a pound, which is 15 shillings, and adde 20 pence to it, and the totall is 16 shillings, 8 pence; which is 5:6 of a pound.

Example.

Example.

N.D		s.	d.
18	3:4	15	0
20	5:6	1	8
2	24	16	8

2. *Example.*

What number is that, from which if you doe ſubtract 8:12, the remayner will bee 6:10. Anſwere, reduce them, and adde them both into one totall, makes 152:120 of a pound for the number you doe ſeeke.

The proofe in coyne; 152:120 of a pound is 304 pence, and 8:12 of a pound is 160 pence, which taken from 304, leaues 144 pence remaining, which is 6:10 of a pound, or 12 ſhillings, as appeareth by the worke.

80	8:	12	152	304	£	s.
72	6:	10	2	160	144	(12
					222	
152		120	304	144	£	

What

What number is that, which being multiplied by 3:5, the product wil be 9:20. Answere, diuide 9:20 by 3:5, and the quotient is 45:60, or 3:4. For the proofe, multiply 108 pence, which is 9:10 of a pound, by 240, the product is 25920; which diuide by 144, or 3:5, which is 12 shillings, makes 180 pence, or 3:4 of a pound.

3. *Example.*

			108
45	1150	d.	240
9 : 20	28920	(180	
3 : 5	14444		4320
60	144		216
	1		
			25920

Example.

What number is that, which being diuided by 7:8, the quotient will be 4:5. Answere, multiply 7:8 by 4:5, the product is 28:40, or 7:10, which makes 14 shillings.

The proofe in Coyne; 7:8, which is 210 pence, by 4:5, which is 192 pence, and the product is 40320; which diuide by 240, makes 168 pence, or 14 shillings: behold the example following.

Example.

Example.

s. d.	s.	
6:8 or 17 6	4:5 or 16	192
12	12	210
40	32	1920
17	16	384
210	192	40320

1			
1690	d.	4	s.
40320	(168	168	(14
24440		122	
22		1	

Rules

Rules of Practice.

Rules of Practice by the first Table.

TO worke by the Aliquot parts of a pound, ſearch in the firſt Table for your giuen price, and by that number found, diuide your number giuen, and the quotient is your anſwere in pounds, and the remayner is the fraction of one pound.

But if the giuen price be not found exactly at the firſt entrance, then find 2, or more numbers, to make the giuen price, and then worke as followeth.

Example.

If one yard coſt 3 ſhillings 4 pence, what will 7859 yards coſt at that rate: I enter the Table, and againſt 3 ſhillings 4 pence, I find 1:6 of a pound; wherefore I diuide 7859 by 6, makes 1309 pound, 5:6 of one pound, or 16 ſhillings 8 pence.

20	5		l.		s.	d.
7859		(1309	5:6	or	16	8
6666						

The first Table.

The Aliquot parts of a pound.			
s. d.	*part.*	*s. d.*	*par.*
1	240	1.4	15
2	120	1.8	12
3	80	2.0	10
4	60	2.6	8
5	48	3.4	6
6	40	4.0	5
8	30	5.0	4
10	24	6.8	3
1. 0	20	10.0	2
1. 3	16	20.0	1
	Diuisors.		

The second Table.

Shillings.			
s.	*par.*	*s.*	*part*
1	$\frac{1}{2}$	11	5.$\frac{1}{2}$
2	$\frac{1}{10}$	12	6.
3	1.$\frac{1}{2}$	13	6.$\frac{1}{2}$
4	2.	14	7.
5	2.$\frac{1}{2}$	15	7.$\frac{1}{2}$
6	3.	16	8.
7	3.$\frac{1}{2}$	17	8.$\frac{1}{2}$
8	4.	18	9.
9	4.$\frac{1}{2}$	19	9.$\frac{1}{2}$
10	5.	20	10.
	Multipliers.		

At 16 pence an ell, what will 8976 elles coſt, I find for 16 pence my diuiſor, to bee 15, and ſo diuiding 8976 by 15, the quotient is 598 pound, 6:15, or 2:5, which is 8 ſhillings.

Example

Example.

2			
242	*l.*		*s.*
8976 (598	6:15,	or 2:5	is 8
2599			
22			

Adde a Cypher to your number giuen, and the laſt figure of your quotient will bee primes, euery one in value 2 ſhillings, and the remainer is the fraction of a prime, alwaies leſſe then 2 ſhillings. In the firſt example, the remainer was 5:6 of one pound, but if you adde a cypher, the quotient will be 1309 pound, 8 primes or 16 ſhillings, and the remayner is 2:6 of one prime, or 1:3, which is 8 pence.

2	92	*l.* 1		*s.*	*d.*
78590	(1309.	8	1:3	or 16	8
66666					

At 2 ſhillings 6 pence a pound pepper, what will 2436 pound coſt: find 2 ſhillings, 6 pence 1 : 8 of a pound, wherefore adde a cypher, and diuide, by 8, makes 304 pound, 10 ſhillings.

```
    4        l.  1    s.
24360 (304   5  or 10
 8888
```

At 8 *d.* a pound Ginger, what wil 77856 pound coſt; diuide by 30, adding a cypher, makes 2595 pound, 2 primes, or 4 ſhillings.

```
121          l.  1    s.
778560 (2595   2  or 4
333330
```

At 17 pence a pound Sugar; what ſhall 23459 pounds coſt: for 12 pence, diuide by 20, makes 1172 pound, 9 primes, 1:2, or 19 ſhillings: then for the reſt of your giuen price, which is 5 pence; take 48, and diuide, and the quotient is 488 pound, 7 primes, which added together into one ſum, makes the totall 1661 pound, 13 ſhillings, 7 pence.

Example.

Example.

```
 1  11          l.  1
234590 (1172.  9  1:2
222220

  431
 42154      l.  1
234590 (488   7  7:24
 48888
  444

          l.   s.  d.
       1172.  19.  0
        488.  14.  7
```

The summe. 1661. 13. 7

At 6 shillings 8 pence a pound Cloues, what will 3769 pound waite cost: diuide by 3, makes 1256 pound, 3 primes, 1:3, or 6 shillings 8 pence.

```
 1111        l.  1          s.  d.
37690 (1256   3  1:3, or 6.  8
33333
```

At 22 pence an elle of Holland, what 3768 elles coſt: for 20 pence diuide by 12, makes 314 pound, and for 2 pence by 120, makes 31 pound, 4 primes, or 8 ſhillings; the totall is 345 pound, 8 ſhillings.

x8	l.	x4	l.	1
37680 (3	14	37680 (3	1.	4
xxxx		xxxx0		
xx		xx		

3140
318

345 8

If one elle of Holland coſt 20 pence, how many elles ſhall I buy for 345 pound: multiply 345 by the price, which is 1:12, or by 12, makes 4140 elles, the ſumme deſired.

345	56	l.	
12	4x40 (3	45	The proofe.
	xxxx		
690	x1		
345			
4140			

If

If one elle of Ozenbrigs coſt 8 pence, what ſumme of elles will 78 pound buy me: multiply by 30, makes 2340 elles.

78
30

2340 elles.

78
15

390
78

1170

22 *elles.*
2170 (78
259
2

At 15 pence an elle of Canuas, how many elles will 100 pound buy: multiply by 16, makes 1600 elles.

If one elle of parchment lace coſt 1 penny, how many ells ſhall I haue for 73 pound: multiply by 240, makes 17520 elles.

Example.

```
  240
   73
-----
  720
 1680
-----
17520
```

```
   7     l.
17520(73
 2440
   2
```

If one Acre of land bee 5 ſhillings, how many Acres may I hire for 132 pound; multiply by 4, makes 528 Acres.

```
  132
    4
-----
  528 Acres.
```

Rules of Practice by the ſecond Table.

If the price giuen be any number of ſhillings, ſearch in the ſecond Table for the price giuen, and by the number there found: multiply your number of yards, ells, pounds or pieces, and cut off the laſt figure with a daſh of the penne for primes, euery one in value

value 2 ſhillings, and the product is the ſum of pounds and ſhillings that your giuen number will coſt.

Example.

At 2 ſhillings an elle of Holland, what will 956 elles coſt: in the ſecond table I find the tenth of the number giuen, ſo that if you take the tenth of 956, it is 95 pound, 12 ſhillings, onely by cutting off the laſt figure by a daſh of the penne.

956 elles at 2 *s.* an ell, makes 95|6, or 12 *s.*

At 7 ſhillings an ell of Cambricke, what will 789 elles coſt: multiply by 3 1:2, or take halfe of the giuen number, and multiply the whole number giuen, by 3, makes in one ſumme, cutting off the prime line, 276 pound, 3 ſhillings.

Example.

789
3 1:2

2367
394 1:2

1
276|1 1:2

Alſo 1240 elles at 7*s.* 434*l.*
3 1:2

3720
620

434|0

At 25 ſhillings a piece Rayſons, what will 356 pieces coſt: take alwaies half the number of ſhillings of your giuen price for your multiplier, and worke as before, and the product is 456 poued, 0 prime.

Example.

Example.

356
12 1:2

4272
178

445|0

Alſo 75032 pieces at 26 ſhilling a piece.

75032
13

225096
75032

97541|6 or 125.

If one barrell of Sope coſt 47 ſhillings, what will 3584 barrels coſt: multiply by 23 1:2, makes 8422 pound, 8 ſhillings.

Example.

3584
23 1:2

10752
71682
179

1

8422|4

At 3 pound 6 ſhillings a Barrell, what will 124 coſt.

124
33

372
372

1

409|2

If

If one Acre of land coſt 6 pound 8 ſhillings, what will 758 Acres coſt: multiply by 64 ſhillings, which is halfe the price, the product is 4851 pound, 4 ſhillings, or two primes.

758
64
3032
4548
1
4851|2

How to proue the laſt queſtion, or any other of like kind. If one Acre of land coſt 6 pound 8 ſhillings, how many Acres ſhall be bought for 4851 pound, 4 ſhillings: diuide your number of pounds and ſhillings by one halfe of the number of ſhillings in the price giuen, adding a cypher to your number of pounds, and the quotient is the number of Acres of land the ſaid ſumme wil buy at that rate.

Example.

Example.

The giuen ſum is 4851 pound, 2 primes, or 4 ſhillings; which diuided by halfe the giuen price, which is 64 ſhillings, brings into the quotient 758 Acres: and ſo of any other ſumme.

9
37 *Acres.*
4851 22 (758
6444
66

A Merchant bought Cambricks, coſt him 855 pound, 18 ſhillings; the queſtion is, how many pieces hee had, paying for euery piece 27 ſhillings Anſwere, adde a cypher to your number giuen, which 855 pound, 9 primes, makes 85590; which diuide by half the price giuen, which is 13 1:2; or diuide by 135 the quotient will bee 634 pieces: now the reaſon wherefore a cypher is added to the number giuen, hauing 9 primes in it is, becauſe I diuide by 13 1:2, which hath one fraction; and this rule is generall.

Example.

Example.

What coſt 6 3 4 pieces, at 27 ſhillings.

```
                          634
                           13  1:2
 454  Pieces.
85590 (634                1902
13555                      634
 135                        317
  1
                                 1
                 The Proofe.  855|9
```

How to prooue one queſtion in the Rules of Practice, by working of another.

If you wil proue any queſtion in the rules of Practice, by a ſecond example marke the complement, or want of your giuen price from one pound, and worke the ſame number at that price which doth want, and the totall of thoſe two ſummes added together, makes the iuſt number of pounds of the giuen ſumme.

Example.

Example.

At 16 ſhillings a piece of Fuſtian, what will 320 pieces coſt. Anſwere; multiply by 8, makes 256 pound, 0 prime.

Againe, 16 ſhillings your giuen price wanted 4 ſhillings of one pound, wherefore worke 320 at 4 ſhillings, which is multiplied by 2 primes, makes 64 pound, 0 prime, the totall is 320 pound, which prooues the former worke.

320	320	356
8	2	64
256|0	64|0	320 *pound.*

Example.

At 13 ſhillings a piece of Lawne, what will 752 pieces coſt: 752 by 6 1:2, makes 488 pound, 8 primes.

At 7 ſhillings a piece, what 752 pieces: 752 by 3 1:2, makes 263 pound, 2 primes, totall is 752 pound.

Example

Example.

725	725
6 1:8	3 1:2
4512	2556
376	376
4888	2632
	4888
	7520

Rules

Rules of Practice by the third Table, the most excellent of all the other.

The third Table.

The Aliquot parts of 24.			
d.	*part.*	*d.*	*part.*
1	24.	13	2. 24
2	12.	14	3. 4
3	8.	15	2. 8
4	6.	16	3. 3
5	12.8	17	3.4. 8
6	4.	18	2.. 4
7	8.6	19	2.8. 6
8	3.	20	2. 3
9	4.8	21	2.4. 8
10	4.6	21	2.4. 6
11	3.8	23	2.3. 8
12	2.	24	$\frac{1}{15}$

Diuisors.

The fourth Table.

The parts of a Shilling.			
d.	*par.*	*d.*	*part.*
$\frac{1}{4}$	48	7	2. 12
$\frac{1}{2}$	24	8	1. $\frac{1}{3}$
$\frac{1}{3}$	18	9	2. 4
$\frac{2}{4}$	16	10	2. 3
—	—	11	2.3. 6
d.		12	*Idem.*
1	12		
2	6		
3	4		*Diuisors.*
4	3		
6	2		

Diuide

Diuide the number of ells, yards, pounds, or pieces giuen by the number, or numbers found in the third Table, alwaies cutting the last figure for primes; if that any remaine after Diuision, it is alwaies lesse then one prime, or 2 shillings.

Example.

At 3 pence a pound Licoras, what will 123728 pound cost. Answere; for 3 pence in the third Table, I find my Diuisor to bee 8, by which I diuide my giuen number, makes 1546 pound, 6 primes, or 12 shillings.

```
 4  54          l. 1    s.
123728 (1546|6 or 12,
 88888
```

At 9 pence the pound Ginger, what will 8768 pound cost: for 6 pence diuide by 4, makes 219 *li.* 2 primes; then for 3 pence the residue of the price, diuide by 8, makes 109 pound, 6 primes, totall is 328 pound, 16 shillings. Or otherwise, diuide by 4 for 6 *d.* and then take half that product for 3 pence, and adde them into one summe, as before.

Example.

Example.

3	*l.*	1		4	*l.*	1	
8768 (219.	2			8768 (109.	6		
4444				8888	219.	2	
					328.	8	

At 11 pence the yard Canuas, what will 2356 coſt: for 8 pence diuide by 3, makes 78 pound, 5 primes, 1:3 or 8 pence; and for 3 pence, diuide by 8, makes 29 pound, 4 primes, 1:2, or 12 pence; the totall is 107 pound, 19 ſhillings, 8 pence.

2211	*l.*	1	*d.*		734	*l.*	1	
2356 (78.	5.	8		2356 (29.	4.	1:2		
333				888				

	l.	*s.*	*d.*
	29.	9.	0
	78.	10.	8
	107.	19.	8

A ſecond

A second example, the proofe of the last.

At 13 pence a pound fine Sugar, what will 2356 pound coſt: for 12 pence diuide by 2, makes 117 pound, 8 primes, or 16 ſhillings; then for 1 penny, diuide by 24, makes 9 pound, 8 primes, 4 pence, the totall is 127 pound, 12 ſhillings, 4 pence; which added to the former ſumme in the laſt example, makes 235 pound, 12 ſhillings; and ſo much will 2356 pound coſt at 2 ſhillings a pound, becauſe the two giuen prices make one prime, or 2 ſhillings.

Example.

21	*l.*	*i*		294	*l.*	*i.*	*d.*
2356	(117.	8.	*d.*	2356	(9.	8.	4
2222	9.	8.	4	244			
				2			
	127.	6.	4				
	127.	12.	4				
	107.	19.	8				
	235.	12.	0				

At 16 pence a pound Sugar, what will 78432 pound coſt: worke for 8 pence, and double the ſumme, makes 5228 pound, 8 primes, or 16 ſhillings.

At 8 pence a pound Almonds, what will 78432 pound coſt: diuide by 3, makes 2614 pound, 4 primes, or 8 ſhillings; which added with the former example, makes 7843 pound, 2 primes, which is the price that 78432 pound will coſt at 2 ſhillings a pound, and prooues both examples true.

Example.

x	xx		l.	i
7	8432	(2614.		4
3	3333	2614.		4
		5228.		8

x	xx		l.	i
7	8432	(2614.		4
3	3333	5228.		8
		7843.		2

At

At 18 pence a pound Comfits, what will 78432 pound coſt: for 12 pence take halfe the giuen number, and for 6 pence take halfe of that ſumme, which added into one totall, makes 5882 pound, 4 primes.

78432

39216
19608

5882|4 *Primes.*

The totall is 5882 *l.* 8 *s.* 0 *d.*

At 6 pence a pound ſmall Ginger, what will 78432 *li.* coſt: diuide by 4, makes 1960 *li.* 8 primes, or 16 ſhillings; which added to 5882 pound, 8 ſhillings, makes 7843 pound 2 primes, the price at two ſhillings.

					l
32	*l.*	*l*	5882	4	
78432 (1960	8	1960	8		
44444					
		Proofe	7843	2	

These tables may ſerue alſo, if the price bee aboue 2 ſhillings, or one prime: as if

you ſhall ſay at 3 ſhillings, 6 pence an ell, what 782 elles: here I ſee the giuen price is compounded of 7 times 6 pence; wherefore I worke firſt for 6 pence in diuiding by 4, makes 19 pound, 11 pence; which multiply by 7, makes 136 pound, 17 ſhillings for the price of 782 elles at 3 ſhillings, 6 pence the elle.

At 6 pence an elle, what 782 elles: find for 6 pence, 19 pound 11 ſhillings, which added to the former ſumme in the laſt example, makes 156 pound, 8 ſhillings, which is the ſumme that 782 elles will coſt at 4 ſhillings the elle.

Example.

32	*l.*	1			*s.*
782 (19	5	1:2	or	11	
444					

l.	*s.*		
19	11		782
7	7		2
136	17	*The proofe.*	156|4

At

At 4 ſhillings 8 pence the elle Holland, what will 2148 elles coſt. I find 4 ſhillings 8 pence to be 14 Groats, ſo diuiding by 6 for one Groat, makes 35 pound, 8 primes; which multiply by 14, makes 501 pound, 4 ſhillings.

```
                          358
                           14
  3      l.   1        ----------
2148(35   8            1432
 666                    358
                       ----------
   The totall.         501|2 Primes.
```

At 15 pence a groce of points, what will 2256 groſſe coſt. 15 Pence is 5 times 3 *d.* and ſo I diuide 2256 by 8, makes 28 pound, 2 primes; which multiply by 5, makes 141 pound.

```
  61      l.   1          282
2256 (28   2                5
 888                    ----------
                         141|0
```

Rules of Practice by the fourth Table.

If the number of the price giuen bee any Aliquot part of a ſhilling: enter the fourth Table, and there you ſhall find a Diuiſor, by the which if you diuide your number giuen, the Quotient will be ſhillings, and the remainer parts of one ſhilling. Then to conuert your ſhillings into pounds, take one halfe of the Quotient, cutting off the lower number for ſhillings, and the reſt is pounds.

Example.

At 3 farthings a pound prunes, what will 756 pound wayte coſt. Search in the fourth Table, and you ſhall find 16 for your Diuiſor: by the which if you diuide 756, the Quotient is 47 ſhillings, 1:4, or 3 pence.

```
1 1 4   s.          1   4        s.
7 5 6(47  1:4    8 9 7 6 5 2(5 6 1 0 3  1:4
1 6 6            1 6 6 6 6 6 ------------
  1                1 1 1 1   2 8 0 5|3  3 d.
```

At

At 1 halfe penny a pound Coporas, what will 8756 pound coſt. Diuide by 24 makes 364 ſhillings, of which the one half cutting of the 4 ſhillings, is 18 pound 4 ſhillings; and 20 halfe pence remaining, totall is 18 pound, 4 ſhillings, 10 pence.

```
  12
 1510      s.        l.   s.   d.
 8756 (364          18.   4.   10
 2444  18|4
  22
```

At 4 pence a pound Licoras, what will 789 pound coſt. Diuide by 3, makes 13 pound, 3 ſhillings.

Againe, at 6 pence a pound, what will 8579 pound coſt. Diuide by 2, makes 214 pounds, 9 ſhillings, 6 pence.

```
1. Example.                2. Example.

1        s.        111        s.          d.
789(263            8579(4289   1:2   or 6
333 ———————        2222 ———————
   13 l. 3 s.            214 l. 9 s. 6 d.
```

Generall Rules of Practice without Tables.

Multiply your number giuen by the ſum of pence, that one yard, piece, pound, or elle doth coſt, and the product will be the ſumme of pence, the whole number giuen will coſt; and then diuide that ſumme of pence by 4, makes the Quotient Groats, and if any remaine, they are pence, alwaies leſſe then 4 pence, or one Groat: and ſecondly againe, diuide that Quotient will bee pounds and primes, euery prime in value 2 ſhillings, and the remaines is Groats, alwaies leſſe then 6 Groats, or one prime, which is value 2 ſhillings.

At 17 pence an ell Canuas, what will 3245 elles coſt: Multiply by 17, makes 55165 pence, which diuided by 4, makes 13791 Groats, and there will remaine one penny. Secondly, diuide that Quotient againe by 6, makes 229 pound, 8 primes, and the remayner is 3 Groats, or one ſhilling; and ſo the totall is 229 pound, 17 ſhillings, 1 penny.

Example.

Example.

```
  3245
    17
-------
 22715
 3245
-------
 55165
```

```
      d.
 133  1  Groats.
 55165 (13791
 44444
```

```
Groats.
 1553        l.  s      s. d.
13791 (229. 8. or 17. 1
 6666
```

At 3 ſhillings, 7 pence a yard Holland, what will 752 elles coſt: multiply 752 by 43 pence, the price of one ell, makes 32336; which diuided, as is before taught, makes 134 pound, 14 ſhillings, 8 pence.

Example.

Example.

752
43

2256
3008

32336

2 *Groats.*
32336 (8084
4444

Groats.
22422
80844 (134. 7. 8
6666

At 7 ſhillings, 11 pence the elle Cambricks, what will 856 ells coſt. Reduce 7 ſhillings, 11 pence into pence, makes 95 pence; by which multiply 856, makes 81320; which diuided as before, makes 338 pound, 16 ſhillings, 8 pence.

Example.

Example.

```
   856
    95
-------
  4280
 7704
-------
 81320
```

Pence.

```
   1
81320(20330
44444
```

Groats.

```
 2552      l. 1  d.
20330(338. 8. 8
 6666
```

At 2 ſhillings, 11 pence an elle Holland, what will 7856 elles coſt: multiply, and diuide as is before taught, makes 1145 *li.* 13 ſhillings, 4 pence.

Example.

Example.

```
   7856
     35
-------
  39280
 23568
-------
 274960
```

Pence.

```
 321
274960(68740
 44444
```

Groats.

```
 2344        l.  1
68740 (1145.  6
66666
```

At 17 ſhillings, 7 pence a yard Broad Cloath, what will 7856 yards coſt: multiply by 211, the price of one yard, and diuide as before, makes 6906 pound, 7 primes.

Example.

Example.

7856
211

22 Groats.

7856 1657616(414404
7856 444444
15712

1657616

Groats.
5 42 l. 1
414404(6906 7
66666

If your giuen price haue any farthings in it, then reduce your price into farthings, and multiply your giuen number by those farthings, and the product will be the number of farthings, which your summe will cost: then diuide that product by 16, makes the quotient Groats, and the remainer will be farthings, alwaies lesse then 16, or one Groate. Secondly, diuide that quotient of Groats by 6, makes pounds and primes, as before.

Example.

Example.

At 5 ſhillings, 1 penny, one halfe-penny an ounce Plate, what will 356 ounces coſt. Reduce 5 ſhillings, 1 penny, half-penny into farthings, makes 246 farthings: by which multiply 356, makes 87567 farthings; which diuided by 16, makes 5473 Groats, and 8 farthings will remaine; which diuide againe by 6, makes 91 pound, 2 primes, and one Groat will remaine, totall is 91 pound, 4 ſhillings, 6 pence.

At 6 ſhillings, 9 pence, farthing an ounce of gilt plate, what will 3542 ounces coſt: multiply your ſhillings by 48, the farthings which are in one ſhilling, makes 288; to the which adde 37 farthings, which are in 9 pence, farthing, makes 325 farthings, and then worke as before is taught, and you ſhal find 1199 pound, 2 ſhillings, 3 pence, halfe-penny.

Example.

Example.

```
   3542      Farthings.
    325        1  11
 ---------      35714
  17710      1151150 (71946
   7084       166666
  10626        1111
 ---------
 1151150

      1554        l.  1
      71946 (1199.  1.
      66666
```

Another way to worke Practice.

Diuide your number of yards, elles, or pieces by 240, adding a Cypher to your number giuen, and then multiply the Quotient by your price, and the Product is the summe of pounds, and shillings, that the giuen number will cost.

At 17 pence the elle Canuas, what will 7848 elles cost: adde a Cypher, and diuide 78480 by 240, and the Quotient will bee 32 pound, 7 primes; which multiply by 17 pence,

Example.

At 5 ſhillings, 1 penny, one halfe-penny an ounce Plate, what will 356 ounces coſt. Reduce 5 ſhillings, 1 penny, half-penny into farthings, makes 246 farthings: by which multiply 356, makes 87567 farthings; which diuided by 16, makes 5473 Groats, and 8 farthings will remaine; which diuide againe by 6, makes 91 pound, 2 primes, and one Groat will remaine, totall is 91 pound, 4 ſhillings, 6 pence.

At 6 ſhillings, 9 pence, farthing an ounce of gilt plate, what will 3542 ounces coſt: multiply your ſhillings by 48, the farthings which are in one ſhilling, makes 288; to the which adde 37 farthings, which are in 9 pence, farthing, makes 325 farthings, and then worke as before is taught, and you ſhal find 1199 pound, 2 ſhillings, 3 pence, halfe-penny.

Example.

Example.

3542	*Farthings.*	
325	2 21	
	35724	
17710	2252250	(71946
7084	266666	
10626	2222	
1151150		

2554	*l.*	*s*
72846	(1199.	3.
60000		

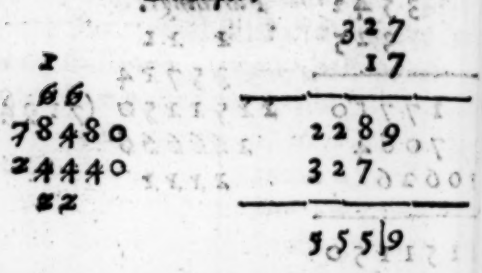
Another way to worke Practise.

Diuide your number of yards, elles, or pieces by 240, adding a Cypher to your number giuen, and then multiply the Quotient by your price, and the Product is the summe of pounds, and shillings, that the giuen number will cost.

At 17 pence the elle Canuas, what will 7848 elles cost: adde a Cypher, and diuide 78480 by 240, and the Quotient will bee 32 pound, 7 primes; which multiply by 17 pence,

pence, the price, makes 555 pound, 9 primes or 18 ſhillings.

Example.



At 3 ſhillings, 5 pence an ell of Holland, what will 702 elles coſt: diuide 7020 by 240, makes 2 pound, 9 primes, and there will remaine 6; which multiply by 41 pence, the price of one ell, makes 118 pound, 9 primes, or 18 ſhillings, and then the 6 elles, makes 1 pound, 6 pence, the totall is 119 pound, 18 ſhillings, 6 pence.

Example.

Example.

						2|9	
226						41	
7020 (2|9							
2440						29	
2						116	
						118|9	
s.	*d.*		*l.*	*s.*	*d.*		
3	5		118	18	0		
	6		1	00	6		
20	6		119	18	6		

At 19 pence the elle of Holland, what will 32544 elles coſt: diuide 325440 by 240, makes 1356; which multiply by 19 pence, the price of one elle, makes 2576 pound, 8 ſhillings.

						135|6	
19						19	
83							
325440 (1356						12204	
244440						1356	
222							
						2576|4	

The Golden Rule.

Of ſingle proportion Direct, or the Rule of three, called *The Goulden Rule.*

IN this Rule of 3 Direct, there is alwaies three termes giuen, and a fourth required, and it is called the Goulden Rule, in regard of the excellency of this Rule aboue all others. The difficulty of this rule conſiſteth in the right placing of the three numbers giuen, ſet the terme next your right hand, whhereupon the queſtion is moued, and a terme of the ſame nature towards the left hand, & the third terme in the middle. Then multiply the ſecond nũber by the third, and diuide the product by the firſt, and the Quotient is the fourth proportional number ſought or deſired to be found out; whoſe denomination is euer like vnto the middle number.

1. *Example.*

1. *Example.*

If 90 yards of Cloath cost 23 pound, what cost 346 yards.

```
                                  346
                                   23
 23      l.                      ----
7958 (88  38:90 of a li.         1038
 990                             692
                                 ----
                                 7958
```

If 124 pound gaine 37 pound, 12 shillings, what will 758 pound gaine.

```
                 37  12          758
                   20            752
                ----------      ----
                752              116
                                 140
   1                             240
 1281                            355
 74052        l.                 356
570016(4596 112:124              495
124444                          ----
 1222                           570016
  11
```

How to worke this last example, and all other, after a more briefe and exact manner.

Diuide the third number by the first, and by the Quotient multiply the second, and the product is the answere.

Example.

If 356 elles cost 137 pound, 12 shillings, 9 pence, what cost 2848 elles.

```
                137. 12. 9
      0              8
  2848(8 ------------------------
   356        1096. 96.72(6
                  5   6 12
              ------------------
              1101    2
```

Totall is 1101 *li.* 2 *s.* 0 *d.*

First, diuiding 2848 by 356, the Quotient is 8; by which I multiply 137 pound, 12 shillings, 9 pence, the products are 1096 pound, 96 shillings, 72 pence; then diuide 72 by

72 by 12, is 6 ſhillings; which added to 96 ſhillings, makes 102 ſhillings, or 5 pound, 2 ſhillings; the totall is 1101 pound, 2 ſhillings, as before.

2. *Example.*

If 124 yards coſt 17 pound, 10 ſhillings, 1 penny, what coſt 744 yards.

	l.	*s.*	*d.*
	17	10	1
	6		
744 (6			
224	102	60	6
	3		
	105	0	6

If 32 pieces of Rayſons coſt 19 pound, 2 ſhillings, 2 pence, what will 112 pieces coſt at that rate.

3. *Example.*

	l.	*s.*	*d.*
	19.	2.	7.
	$3\frac{1}{2}$		
16			
22 (3 $\frac{16}{22}$, or $\frac{8}{11}$	57.	10.	7.
32	9	7	
	66.	17	7.

If 356 pieces coſt 137 pound, 12 ſhillings, 9 pence; what will 2848 pieces coſt at that rate.

137. 12. 9	33033
20	2848
2752	20224
12	24404
33033	10112
	12202
	20224
	24404
	66066
	94077984

Example.

Example.

```
        21
      15924
     22813720
     ---------
356 | 94077984 (264264
    | 00000000
     ---------
     71264264
     2132132
      14714
        21
```

94077984

Example.

```
  20  2              l.  1
2642640 (1101  1
2444440
  2222
```

How to know whether any queſtion giuen be to be anſwered by the Rule Direct, or Conuerſed.

By theſe notes following, you ſhall find, whether any queſtion propounded be to be anſwered by the Rule of Direct, or conuerſed; for alwaies the third number is the number whereon the queſtion dependeth, and is diſtinguiſhed from the other two, by ſome one of theſe notes following.

How much. *How wide.*
How deepe. *How long.* or ſuch like.
How farre. *What coſt.*

And the anſwer is alwaies, more or leſſe, ſo that if it bee more then the leſſer of your two extreame numbers is the diuiſor: if leſſe, then the greater of your two extremes is your diuiſor. If the number whereon the queſtion bee depending, be your Diuiſor, thē the anſwer is, by the conuerſe Rule, and you muſt multiply your two former numbers for Diuidend. If the firſt number be the Diuiſor, then the queſtion is anſwerable by the Direct Rule, and the product of the two latter numbers is your Diuidend.

Example.

Example.

If 13 Cannons ſpend 358 pound of powder, what will 5 Cannons ſpend, now here the queſtion is, what 5 Cannons will ſpend. I anſwere, leſſe then 13 Cannons; wherefore by this rule, the greater of the two extreames, 13 is the diuiſor: wherefore I multiply 358 by 5, and diuide by 13, makes 137 pound, 6:13 that 5 Cannons will ſpend.

2. *Example.*

If 13 Cannons ſpend 358 powder, what will 5 Cannons ſpend.

358	x		
5	4 8 9	*l.*	
1790	x 7 9 0	(137	9:13
	x 3 3 3		
	x x		

2. *Example.*

I lent my friend 115 pound for 7 moneths, and when I came to him to require the like kindneſſe he could lend me by 54 pound, the queſtion

queſtion is, how long hee ſhould forbeare that 54 pound to make requitall, or to equal my time, and kindneſſe.

If 115 pound require 7 moneths, what will 54 pound require: here the anſwere in reaſon is, that 54 pound muſt bee longer time forborne then 115 pound, and ſo the anſwere is more times then 115 pound; ſo that I find the leſſer of my exteames 54, is my Diuiſor, and the queſtion anſwerable by the Rule conuerſed, ſo that I multiply 115 by 7, makes 805; which diuided by 54, makes 14 moneths, 49:54 of a moneth, or 14 moneths, 25 dayes, 23:25

Example.

115	4	
7	269	*Moneths.*
805	805	(14 49:51
	544	
	5	
49		
28	2	
392	292	*Dayes.*
98	1372	(25 22:25
1372	544	
	5	

A

4. *Example.*

A Captaine of a Band of men is besieged in a Citie, hauing with him 7200 men, and his victuals will serue the whole Company but 7 moneths, but there is no hope left to haue any fresh victuals vntill 16 moneths; the question is, how many men he shall send away to make the victuals serue for 16 moneths. Answere, lesse then 7200 men.

If 7 moneths require 7200 men, how many will 16 moneths aske.

```
  7200
     7        28      Men.
 ------      50400 (3150
 50400       16666
             111
```

When Wheate was sold at 3 shillings, 8 pence the bushell, the penny loafe of bread waighed 6 ounces, what shall the same loafe of bread waigh, when Wheat is sould for 2 shillings the bushell: I answere more then 211 ounces.

If

If 44 pence giue 6 ounces, what will 24 pence giue.

```
  44        2    Ounces.
   6      264 (11
 ----      244
 264        2
```

If 356 men digge a trench in 24 dayes, in how many dayes will 200 men make the ſame? Anſwere, in more dayes; 42 dayes, 17 houres, 7:25.

If 356 men require 24 dayes, how many will 200 men require.

```
  356
   24
 ----        1      Dayes.
 1424      8544 (42  144:200
 712       2200
 ----
 8544
          144
           24
 ----------      1      Houres.
          576   3456 (17  7:25
         288    2200
 ----------
         3456
```

Or

Or thus; Conſidering the numbers, 200 may be had in 156 once, therefore for 200 take 24 dayes; then for 150 take 18 dayes, totall 42 dayes; then there will remaine 6 to bee multiplied by 24, makes 144: 200 parts of a day, as before.

If 112 pound coſt 3 pound, 5 ſhillings, 5 pence, what will 3136 pound coſt? diuide 3136 by 112, makes 28; which multiply by 3 pound, 5 ſhillings, 5 pence, makes 91 pound, 11 ſhillings, 8 pence.

	l.	*s.*	*d.*
	28.	28.	28
	3	5	5
89			28
3136 (28			240 (11
222	84	11	222
22	7	140	2
	91	11	8

If 100 pound gaine 7 pound, what ſumme of money will gaine 85 at that rate? Anſwere.

If

If 7 pound require 100 pound, what will 85 pound, require.

x x 3 2	*l.*	85
8500 (1214 2:7		100
7777		8500

Or otherwise, diuide 85 by 7, makes 12 1:7; by which multiply 100, makes 1214 pound 2:7 of a pound.

x x		100
85 (1 2 1:7		12 1:7
77		1214 2:7

Or otherwise, diuide 100 by 7, makes 14 2:7; by which multiply 85, makes 1214 pound, 2:7

Example.

Example.

32
100 (1.4 2:7
77

85
14 2:7
340
85
24 1:7
1214 1:7

Carſeys at 54 ſhillings the piece, are put in Barter, at 3 pound the piece, how ſhall Wooll worth 24 ſhillings the Tod, be ſet in Barter, to make the bargaine equall?

If 54 ſhillings be 60 ſhillings, what ſhall 24 ſhillings make.

Anſwere: for more then 24 ſhillings, and leſſe then 54, ſo that 54 is the diuiſor, and multiplying 24 by 60, makes 1440; which diuided by 54, makes 26 ſhillings, 2:3, or 8 pence.

If 54 ſhillings be 60 ſhillings, what will 24 ſhillings make.

3
3 6 6
1 4 4 0 (2 6 36:54, or 2:3, or 8 d.
5 4 4
5

24
60
1440

If 6 ſheepe coſt 58 ſhillings, how many ſhall I buy for 124 pound? multiply 124 by 58, makes 7192; which diuide by 6, makes 1198 ſheepe 2:3.

124
58
992
620
7192

1554
7192 (1198 2:3
6666

Or otherwiſe, diuide 58 by 6, makes 9 2:3, by which multiply 124, makes 1198 2:3, as before.

Examples

Example.

```
                          124
                            9 2:3
  4                     ----------
 58 (9 2:3              1116
  6                        82 2:3
                        ----------
                        1198 2:3
```

A Merchant at Siuill deliuereth 1500 Rialls, to receiue for euery 11, being a ducat in London 5 ſhillings, 10 pence ſterling money, how much muſt he receiue?

If 11 Rialls be 70 pence, what are 1500 Rials?

```
                          Pence.
                           11
 474                      2387    l.  1
1500 (136 4:11            95450(39.  7
1111      70              24440
        ----------         22
        952
          25
        ----------
        9545              l.   s.  d.
                  Totall is 39.  15.  5
```

At 13 pound in the 100 pound profit, of what stocke came 3274 pound? Answer: diuide 3274 pound by 113 pound, makes 2897 pound, 39:113 of a pound, adde two cyphers to the giuen number.

```
  1  83
 101039        l.
 327400(2897  39:113 of a pound.
 113333
  1111
   11
```

A Merchant receiued for principall and gaine 328 wherein he found he had gained cleare 56 pound, what did he gaine vpon the 100 pound. Answere, multiply 100 by 56, the gaines makes 5600; which diuide by 328, and the Quotient is 17 pound, 3:41 in smallest termes.

```
 100
  56   2324  l.
 ----  5600(17  24:328, or 3:41 of a li.
5600   3288
        32
```

If

If 112 pound coſt 7 pound, 6 ſhillings, how may I ſell to gine 10 pound vpon the 100 pound. Anſwere: Take the tenth part of 7 pound, 6 ſhillings, or of 146 ſhillings, which is 14 ſhillings, 3:5 of a ſhilling; which added to the price, makes 8 pound, 7 pence, 1:5 of a penny.

l.	*s.*				*l.*	*s.*	
7	6		*s.*		7	6	
20		146	(14	3:5		14	3:5
		112					
146					8	00	7 *d.* $\frac{1}{5}$

If 100 pound exchange be 7 pound 2 ſhillings, what is one pound. Anſwere, 71:100 parts of a pound: wherefore multiply 71 by 240, and diuide by 100, makes 17 pence, 12:5 of a penny.

71			*d.*			*d.*
240						
2840	17040	(17	40:100		1	
142	100					
17040			71:100			

If 107 ells of cloth coſt 17 pound 12 ſhillings, what will 321 ells coſt at that rate? Here if you conſider the proportion betweene the firſt number, and the third, you ſhall find the third number doth containe the firſt exactly three times; wherefore you need not to multiply the ſecond by the third, and diuide by the firſt number, but only take the ſecond number, and multiply by 3, makes 52 pound, 16 ſhillings for the price that 321 ells will coſt: behold the worke at large.

If 107 ells of cloth coſt 17 pound, 12 ſhillings, what will 321 ells?

l.	*s.*
17.	12
20	
352	

321
352
642
1605
963
112992

364	*s.*
112992	(1056
107777	
1000	
11	

1	*l.*	*s.*
1056	(52.	16
220		

How

How to find whither that your numbers giuen be proportionall, or not.

Diuide your third number by the firſt, and if the quotient be an euen number, and nothing remaine of your diuidend, then the firſt and third numbers are euen proportionall in whole numbers, as in the laſt example, the firſt number was 107, and the third number 321, ſo that in deuiding the third nũber by the firſt, the quotient is 3 & 0 remaines: wherefore I conclude, that the firſt and third numbers are proportionals in whole numbers, and that the third doth containe the firſt iuſt three times, and ſo often muſt the fourth number ſought for, containe the ſecond; and I conclude, that three times 17 pound 12 ſhillings, which is 52 pound 16 ſhillings, is the fourth proportionall number ſought, as appeareth by the ordinary forme of worke in the laſt example.

		l.	*s.*
		17.	12
321	(3	3	3
107			
		52	16

If 36 elles of cloth coſt 13 pound, 4 ſhillings, 1 penny, what will 432 elles coſt at that rate: diuide 432 by 36, makes 12; by which multiply your ſecond number 13 pound, 4 ſhillings, 1 penny, makes 158 pound, 9 ſhillings.

	13.	4.	1	
7	12.	12.	12	
432 (12				
360	28.	9.	0	
3	13			
	158.	9.	0	

A. doth lend vnto *B.* 600 pound for 8 moneths, the queſtion is, how much *B* ſhall lend vnto *A.* for 12 moneths to recompence him, not reckoning compound, intereſt. Anſwere. If 8 moneths require 600 pound, what will 12 moneths require: the reaſon is leſſe then 600 pound; wherefore diuide 600 pound by 12, makes 50; which multiply by 8, makes 400 pound.

Or otherwiſe by proportion, as 8 is to 12 ſo muſt 600 bee to 400 pound, 2:3 parts of 600 pound.

If the number bee not exactly proportionall, yet there is a great abreuiation to bee made of the worke of Reduction, Multiplication, and Diuision, in the working of most examples in the Golden Rule; as for example.

If 19 Barrels of Figgs cost 16 pound 12 shillings, what shall 58 barrels cost, here diuiding 58 by 19, the Quotient is 3, and 1 will remaine; wherefore I take 3 times 16 pound, 12 shillings for 57 barrels, and I haue to worke but for the one remaining; which is but to diuide 16 pound, 12 shillings, by 19, makes 17 shillings, 9:19 of one shilling, the totall is 50 pound, 13 shillings, 9:19 shillings.

l.	*s.*			
16	12		49 16	9
3	3		17	19
49	16		50 13	9:19

If 356 elles of Holland cost 124 pound 2 shillings 3 pence, what will 7259 elles cost at that rate. Reduce 124 pound, 2 shillings 3 pence, into pence, makes 29787 pence; which multiply by 7259, makes 216123833

pence, which diuide by 356, make 607370; which diuided by 240 pence, makes 253 pound, 170 pence, or 14 shillings 2 pence.

Example.

l.	*s.*	*d.*
124.	2.	3
20		
2482		
12		
4967		
2482		
29787		

29787
7289

64549453
143961136
111602
48447
14353
056
181
8

216223833

356

```
          1251
         263101          d.
356 | 216223833 (607370
      00000000
     ---------
     21360282
       24969
        104
         2
     ---------
     216223833   The Proofe.
     ---------

1201          l.    52    s.   d.
607370 (2530        170 (14.   2
244440              122
 222                 1
```

A second way more briefly to worke this question, or any other of like nature, is this: multiply the third number by the pounds and primes, or shillings and pence, and diuide the product by the first number, and the quotient will bee the fourth number sought. In the last example, 7259 elles was the third number, which multiply by 124 *l.* 1 prime, or 2 *s.* makes 900841 *l.* 9 primes: then

then alſo 7259 by 3 pence, makes 21777 pence; which diuided by 240, makes 90 pound, 14 ſhillings, 9 pence: then adde thoſe two ſums into one totall, makes 900932|6 primes, 9 pence; leaue out 9, and then diuide the reſidue by 356, makes 2530 pound, 7 primes, and 54:356; which with the 9 *d.* brings out the two pence, as in the laſt example.

Example.

7259
1241

7259
29036
14518
7259

900841|9 *d.*
90|7 9

900932|6

7259

d.		d.		
7259		2339	l.	1
3		27770	(90	7
		2440		
21777		22		

Primes.

20			
2882534		l.	1
9029326	(2530		7
3566666			
33333			
333			

If 24 pieces of Rayſons coſt 25 pound, 8 ſhillings, what will 324 pieces coſt: multiply 324 by 25 pound, 4 primes, makes 8229, 6 primes; which if you diuide by 24, the Quotient will be 342 pound, 9 primes, or 18 ſhillings without Reduction, as in the example following.

Example.

Example.

```
  324
  254
-----
 1296        2
1620        10610      l.   1
648         82296 (342    9
-----        24444
82296         222          or,
                        342 l.18 s.
```

If 25 pound gaine 1 pound, 8 ſhillings, what will 725 pound gaine at that rate? Multiply 725 by 1 pound 4 primes, makes 10150; which diuided by 25, makes 40 pound, 6 primes, or 12 ſhillings.

```
  725
   14                      l.   1
-----        10150 (40    6
 2900         2555
 725           22
-----
10150
```

And

And in this ſort may diuers other queſtions bee wrought in pounds and ſhillings without Reduction, which I thought good to giue a taſte of, but I will proceed here no further, becauſe I purpoſe in the ſecond part of this Booke to ſpeake of them at large in the Treatiſe of *Decimal Arithmatick*, whereby all manner of queſtions are to bee wrought of Multiplication and Diuiſion in pounds, ſhillings and pence, without Reduction, as ſhall appeare in their ſeuerall places following. And now I will proceede to ſpeake ſomething of the Rule of Three Direct and Conuerſt in Fractionall operations, wherein I will be as briefe as I may, not intending to increaſe this little Treatiſe intended for a pocket booke, into ouer large a volume.

The Rule of 3 in Fractions.

If your three numbers giuen be all fractions, multiply the third by the ſecond, and diuide the product by the firſt, and the quotient will be the fourth proportionall number ſought for.

Example.

Example.

If 3:4 of a yard of Holland coſt 4:5 of a pound, what ſhall 5:6 of one yard coſt at that rate? Multiply 5:6 by 4:5, makes 20:30 or 2:3, which diuide by 3:4, makes 8:9 of one pound, or 17 ſhillings, 7:9 of one ſhilling.

20	8
4 : 5	2 : 3
5 : 6	3 : 4
30	9

If 7:8 of one ell of cloth coſt 9:12 of a pound, what will 17 elles coſt? Make 17 fraction wiſe, and multiply 17:1 by 9:12, makes 153:12, which wil be both abreuiated by 3, makes 51:4, which diuided by 7:8 makes 408:28 parts of a pound, or in ſmall termes 102:7; then diuide 102 by 7, makes 14 pound, 4:7 of one pound for the price.

153	408	1
17 : 1	51 : 4	226 *l.*
9 : 12	7 : 8	248 (14. 4:7
12	28	288
		2

2. *Rule*

2. *Rule.*

If all your three numbers giuen be fractions, multiply the Numerator of the firſt fraction by the Denominator of the other two fractions, for to make your Diuiſor. Then multiply the Denominator of your firſt fraction by the Numerators of your other two fractions, to make your Diuidend and then diuide by your Diuiſor, and the Quotient is the anſwere ſought: but if your Diuiſor bee greater then your Diuidend, then the Quotient is a fraction, leſſe then a vnite.

Example.

If 3:4 of a yard coſt 4:5 of a pound, what coſt 5:6 of a yard? Multiply 3, the Numerator of the firſt fraction by 5 and 6, the denominators of the other two fractions, makes 90 for your diuiſor; then multiply 4, the denominator of your firſt fraction by 4 and 5, the numerators of your other two fractions, makes 80 for your diuidend: now becauſe your diuiſor is greater then your diuidend, place them fraction wiſe thus, 80:90 of 1 *li.* or in leaſt termes, 8:9 of a *li.*

Example.

Example.

90

If 3 : 4 of a yard
coſt 4 : 5 of a pound } makes 8:9 *l.*
what 5 : 6 of a yard
80

Againe, if 7:8 of an ell coſt 2:3 of a ſhilling, what will 34 ells coſt.

21

If 7 : 8 of an ell,
coſt 2 : 3 of a ſhill.
what 34 : 1 ells coſt.

16

204
34

544

229 s.
544(25 12/21
229
2

or 25 *s.* 19:21 of a *s.*

If 18 Pioners in 3:5 of a day doe make 22 Rodds of Barricadoe, what will they make in 7 dayes.

If

3

If 3 : 5 of a Day
make 22 : 1 of a Wall,
what 7 : 1 of a Day?
770

222 *Rods.* *Rod,*
770 (256 2:3
338

If 12 hundred 3:7 of Allum coſt 15 pound 1:3 *li.* what will 324, 1:8 of a hundred coſt? Reduce the whole and broken numbers into broken, and worke as is before taught.

12 3:7	15 1:3	324 1:8
7	3	8
87 : 7	46 : 3	2593 : 8

28

2038 2063

If 87:7 20852 4 *l.*
coſt 46:3 834946(399 $\frac{1814}{2088}$
what 2593:8 2088888
834946 2088
20

If 7:9 of an ell coſt 8:11 of a pound, what will 15:13 of an ell coſt? 1 pound, 1 ſhilling, 6 pence, 3:4, *fere.*

Example.

1001		72
7 : 9	77	15
8 : 11	13	
15 : 13		360
1080	231	72
	77	
		1080
	1001	

79 *l.* *l.*

1080 (1 79 : 1001

1001

1 *l.* 1 *s.* 7 *d. fere.*

If 3:4 of a yard of Veluet coſt 7:8 of a poũd, what wil 28 yards coſt. 32. *l.* 13 *s.* 4 *d.*

Example.

Example.

24	28
3:4	28
7:8	
28:1	224
784	56
	784

1
616 *l.*
784 (32 2:3 of a pound.
244
2

If 3 ells 1:8 coſt 5:7 of a pound, what wil the whole piece coſt, containing 28 ells 1:2 at that rate? Anſwere.

350		
25:8	1	*l.*
5:7	2280 (6	18:35
57:2	350	
2280		or 10 *s.* 3 *d.* 3:7 of 2 *d.*

If 12 pound, 4 ounces of Quichanella coſt 4 pound, 3 ſhillings, 4 pence, how much will 100 pound buy me at that rate? If 49:4 of a pound coſt 25:6 of a pound ſterling, what will 600:6 parts of a pound buy. Anſwere.

	600	
If	25:6 of a pound	52 l.
buy	49:4 of a pound,	176400(294
what	600:6 of a pound.	66600
	176400	

The proofe of this laſt example. If 100 pound ſtarling buy me 294 pound of quichanella, how much ſhall 4 pound, 3 ſhillings, 4 pence buy mee? to find the valew of the hundred, the rate of one pound being giuen; abate 2 places from 294, and it will bee 2 pound 94:100 parts of one pound: which multiply by 4 pound, 1:6, makes 12 pound 25:100 parts, or one fourth for the proofe.

l. 12		l. 1:2
2:94	5	11:76
4 1:6	294(49	49
	66	
1176		12 2:5

If

If 30 men caſt a Trench in 3 dayes 2:3; how many men would caſt it in 5:6 of a day? here by comparing theſe proportions together, I find that 5:6 the third number, will deſire a greater quantitie of men to performe the worke, then 11:3 of a day will require; wherefore this proportion is reciprocall or backward; wherefore I multiply the two former numbers together, makes 333:3, or in ſmaller termes, 111:1; which diuided by 5:6, makes 660:5; which diuide by the denominator 5, makes 132 men.

330	660	11	*Men.*
11:30	110:1	660(132	
30:11	5:6	55	
3	5		

In the Backward Rule, or Conuerſt in fractions; multiply the Denominator of your third number, by the numerators of both your other numbers for diuidend, then multiply the numerator of your third number, by the denominators of your other two numbers for diuiſor, and then worke as before.

Example.

1980

If 11:3 of a day — 43 *Men.*
giue 30:1 men, — 2980 (132
what 5:6 of a day — 253
15 — 22

If when the bushell of Wheate was sold for 4 shillings, the penny loafe wayghed 6 ounces 1:2, what shall the same loafe weigh when Wheat is sold for 2 shilling, 8 pence pence the bushell? Multiply 48 by 13, makes your diuidend 624: then 2 by 32, makes 64 for your diuisor, and then diuide 624 by 64, makes 9 ounces, 48:64, or 3:4 of an ounce.

624

If 48:1 pence — 48 *Ounces*
giues 13:2 ounces — 624 (9. 3:4
what 32:1 pence. — 64
64

If when one ounce of sterling siluer was worth 1:4 of a pound the penny of siluer weighed 30 graines, what shall the same penny weigh, when the ounce shal be worth 1:3 of a pound.

Example.

Example.

	90		
If	1 : 4 of a pound	~~1~~ 2 *graines*	
giue	30 : 1 graynes,	~~9~~ ~~0~~ (2 2	1:2
what	1 : 3 of a pound.	~~4~~ ~~4~~	
	4		

If when a loade of Hay was ſold for 24 ſhillings, 8 pence, the penny bottle weighed 3 pound, 1:4, what ſhall it weigh, now the load is ſold 37 ſhillings. Anſwere, 2 pound, 71:76 of a pound.

	1040			
If	80 : 3 ſhilling	1 5 2	*li.*	*li.*
giue	13 : 4 pound	~~1~~ ~~0~~ ~~4~~ ~~0~~ (2		71:76
what	37 : 1 ſhillings.	~~4~~ ~~4~~ ~~4~~		
	444			

If 3 yards 1:8 coſt 9 ſhillings, 9 pence, what will 380 yards coſt at that rate? Reduce 3 yards 1:8 into eights, makes 25:8; then reduce 380 yards into eights, makes 3040:8 parts: then 9 *s.* 9 *d.* into pence, makes 117 pence; by which multiply 3040, makes 355680, which diuided by 25, makes 14227 pence, 5:25 of one penny

in the whole 59 pound, 5 ſhillings, 7 pence, 5:25 or 1:5 of a penny. Behold the worke.

yard.		l.	d.	
3	1:8	9	9	380
8		12		8
25		117		3040
				117
20	105	d.		21280
355680	(14227	2½		3040
255555				3040
2222				
				355680

1 d.						
2	69	l.	1	d.	s.	d.
142270	(59.	2.	19.	or 5.	7.	1:5
24440						
22						

The proofe of the former worke. If 380 yards coſt 59 pound, 5 ſhillings, 7 pence 5:25 of one penny, what will 3 yards 1:8 coſt at that rate? reduce your coyne into 25, makes 355680; then reduce your 380 yards into 8, makes 3040; by which di-

uide

uide 144227 pence, makes 9 ſhillings, 9 pence, as before.

```
 14227          59. 5. 7 5:25
    25            20
-------        -------
 71140          1185
28454             12
-------        -------
355680          2377
               1185
               -------
               14227

  51          d.
  512         9  s.  d.
355680 (117 (9  9
304000      12
 3044
  30
```

If 34 ſhip Carpenters build a ſhip in 8 moneths 3 5, in how long time will 120 Carpenters build the ſame? Reduce 8 moneths 3:5 into fifthes, makes 43:5; then multiply 34 by 43, makes 1462. Alſo put your diuiſor 120 into fifthes, makes 600:5; then diuiding of 1462 by 600, the Quotient will

will bee 2 moneths 262:600 parts of one month, or in smallest termes 131:300 parts. And this Rule generall, if one of your numbers bee a fraction, put alwaies your diuisor into the same fraction of your diuidend, and the quotient will bee of the same denomination of your diuidend, and so the answere was moneths, and parts of a moneth.

If 34 Carpenters aske 43:5 moneths, what 600:5 moneth.

```
  34
  43
-----        2      months.   month.
 102        1462(2          131:300
136          600
-----
1462
```

	months.	*dayes.*	*of a day.*
makes	2.	12.	68:300

If 100 pound in 12 moneths gaine 10 pound, what will 336 pound gaine in 8 moneths? Take the tenth part of 336, which is 33 *li.* 6 primes, or 12 *s.* makes 369 *li.* 12 *s.*

Secondly, if 12 moneths gaine 33 pound 6 primes, what will 8 moneths gaine? I answere,

ſwere, leſſe then 33 pound 6 primes; wherefore multiply by 8, and diuide by the greater extreme, 12, makes 22 pound, 4 primes, or 8 ſhillings, the anſwere.

If 120 Pioners in 6 dayes caſt 300 rods of Trench, how many ſhall 600 men caſt vp in 4 dayes. If 120 giue 300, what will 600 giue? Anſwere, 1500 Rods.

Secondly, if 6 dayes giue 1500 rods, how many will 4 dayes giue? I anſwere, leſſe; multiply by 4, and diuide by 6, makes 1000 Rods.

If 112 pound in 12 months gaine 100 *li.* what wil 340 *li.* gaine in 7 months? Anſwer: 303 *li.* 4:7.

Secondly, if 12 moneths gaine 303 *li.* 4:7 what will 7 moneths gaine.

Example.

	7			
		9		
12	2125	8497	*li.*	*li.*
7	7	24875 (177		4/12
		8444		
84	14875	88		

A

A generall Rule.

Put alwaies your diuiſor into the ſame fraction of your diuidend, and your quotient will be of the ſame denomination, that your diuidend was: as in the laſt example, 12 moneths was turned into ſeuenths, and alſo 303 pound 4:7 was turned into ſeauenths of pounds, and ſo the quotient of that diuiſion was pounds, and the fraction of a pound remaining.

If 7 pound in 13 months gaine 3 pound, in how long time will 340 pound gaine 60 pound. Firſt, if 7 pound Gaine 3 pound, what will 340 pound gaine, makes 145 pound, 5:7 of a pound. Secondly, if 145 pound, 5:7 or 1020:7 ask 13 moneths, what will 60 pound, or 420:7 gaine. Multiply by 13, and diuide by 1020, makes 5 months 6:17 of a month.

If 600 great Horſes in 5 dayes doe ſpend 1125 Buſhels of oats, how many buſhels wil ſerue? 1400 Horſes for 22 Dayes. Firſt ſay, if 600 giue 1125, what 1400, makes 2625 buſhels. Secondly, if 5 ſpend 2625 buſhels, what will 22 dayes ſpend? Multiply by 22, and diuide by 3, makes 11550 buſhels.

How

How to worke the double Rule at one operation.

This laſt queſtion, or any other of like nature which is wrought by the double Rule at two ſeuerall operations may be anſwered at one in this manner: multiply the three latter numbers, to make your diuidend one into the other; then multiply the two former numbers for to make your diuiſor, and then diuide the diuidend by the diuiſor, and the quotient will be the ſame, as in the laſt example, 1125 being multiplied by 1400, makes 1575000; which againe increaſed by 22, makes your diuidend 34650000. Then multiply your two former numbers 600 by 5, makes 3000 for the Diuiſor; and then diuiding your diuidend by your diuiſor 3000, the quotient will bee 11550 buſhels, as before at two operations.

Example.

Example.

1125
1400

4500
1125

1575000
22

3150
3150

34650000

600
5

3000

22 *Bushels:*

34650000(11550
33333000

If 35 *s.* in 7 months gaine 6 *s.* in how long time will 340 *l.* gaine 100 *l.* First, if 35 *s.* gaine 6 *s.* what will 340 *l* require? Reduce 340 *l.* into pence, and multiply by 6, makes 40800; which diuided by 35, makes 1165 *s.* 5:7 *s.* Secondly, if 1165 *s.* 5:7 require 7 moneths, what will 100 *l*, require? Makes 12 moneths, 8:816 parts of a moneth.

Fellowship

Fellowſhip without Time.

This Rule differeth very little from the Rule of three; for in this Rule the ſumme of all the moneys disburſed, is the firſt number in the Golden Rule. Then the gaines or loſſe is the ſecond number: the third number is each ſeuerall partners money diſburſed ſo that the Rule muſt bee ſeuerally wrought for each ſeuerall Partners portion.

Example.

Foure Merchants made a company together; the firſt, *viz. A.* put in ſtock 74 pound, *B.* put in 90 pound, *C.* put in 100 pound, and *D.* put in 120 pound, and they found that they had gained 84 pound; now the queſtion is, what each man muſt haue of the gaines, according to the proportion of his money disburſed. Firſt, adde all the moneys disburſed into one totall ſumme, *viz.* 74, 90, 100, 120, totall is 384 for the firſt number in the Golden Rule. Then the ſecond number is 84 pound, the gaines; and the third number is each particular mans ſtock; then worke as followeth.

If

If 384 pound gaine 84 pound, what will A.B.C.D. ſumms gaine to them.

A.	74	16.	72	
B.	90	19	264	
C.	100	21.	336	
D.	120	26.	96	
		2		
The proofe.	384	84.	768	(2
			384	

The like reaſon is in loſſe, as is in gaines. Example: A certaine ſhip being in a tempeſt on the ſea was forced to caſt ouer board ſo much of her lading, as amounted vnto the ſumme of 642 pound, then there is great reaſon that all the venturers ſhould beare part of that loſſe, according to the proportion of his ſtocke which hee ventured. As ſuppoſe: *A.* ventured 700 pound, *B.* 530 pound, *C.* 640 pound, *D.* 800 pound: totall is 2670. Then ſay; If 2670 pound looſe 642 pound, what will each of *A.B.C.D.* looſe? as in the example following.

Example.

Example.

If 2670 pound looſe 642 pound, what will A. B. C. D. ſummes looſe to them.

A.	700	168.	84.	
B.	530	127	117.	267
C.	640	153.	237	
D.	800	192.	96	
		2		

The proofe. 2670. 642. 534 (2
267

Foure Merchants bought a ſhip, which coſt them 3600 pound, whereof *A* muſt pay one third part of the money, *B.* one fourth, *C.* one fifth, *D.* one ſixth; the queſtion is, what each man muſt pay of the ſaid ſumme. Anſwere.

Seeke a number wherein the like parts may bee had, which is 60, and take the like parts of that number for the numbers that you ſeeke, for to find each mans portion of the money which he ſhould pay. Firſt, 1:3 of 60 is 20, the 1:4 is 15, the 1:5 is 12, the 1:6 is 10; which adde into one totall, makes 57 for the firſt number in the Golden Rule.

Example.

Of 60
1:3 is 20.
1:4 is 15.
1:5 is 12.
1:6 is 10.
total is 57.

If 57 be 3600, what will bee the ſummes of *A.B.C.D.*

A.	20	1263.	9
B.	15	947.	21
C.	12	757.	51 || 57
D.	10	631.	33

2

The proofe. 57 | 3600.x x 4 (2
57

The ſaid ſhip made a Voyage to Sea, and hath gotten all charges, deducted out 240 pound, the queſtion is, what each man muſt haue of the gaines. Anſwere.

If 57 gaine 240, what will *A.B.C.D.* ſummes gaine to them.

A.	20	84.	12	
B	15	63.	9	
C.	12	50.	30	57
D.	10	42.	6	
		1.		

The proofe. 57 | 240 | 57 (1
57

Foure

Foure Merchants made a Company; *A.* put in 320 pound, 13 ſhillings, 3 pence; *B.* put in 840 pound, 16 ſhillings, 6 pence; *C.* put in 560 pound, 18 ſhillings, 9 pence; *D.* 1000 pound: and in one yeare they found they had gained 400 pound, 18 ſhillings, 6 pence: the queſtion is, what each man muſt haue of the gaines. Firſt, the totall ſumme of all their moneys makes 2721 pound, 8 ſhillings, 6 pence, or 653142 pence, for the firſt number. Then reduce each ſeuerall mans money diſburſed into pence for the third number, the ſecond is the gaines alſo reduced into pence, and then worke according to the Rule.

Example.

If 2721 pound, 8 ſhillings, 6 pence gaine 400 pound, 18 ſhillings, 6 pence, what will *A.B.C.D.* ſummes gaine to them.

	d.		*li.*	*s.*	*d.*
A.	769311	makes	47.	2.	1
B.	201798	makes	123.	17.	3
C.	134525	makes	82.	12.	9
D.	240000	makes	147.	6.	5
The Proofe.			400.	18.	6

Rules of Fellowſhip, with diuerſitie of Time.

Multiply each mans money disburſed by the time that it continued in ſtock, and gather the totals, as in the laſt Rule, to make the firſt terme in the Golden Rule, and the gaines or loſſe is the ſecond, and then each mans product of money and time for the third terme in the Golden Rule, and worke as followeth.

Example.

Three men made a ſtock, A.B. and C. and in long continuance of time by dangerous aduentures they gained. and got by prizes taken at Sea 2345 pound; A. put in ſtocke 40 pound, 14 moneths; B. put in 50 pound, 8 moneth; C. put in 85 pound 6 moneths, what ſhall each man haue of this gaines.

Example

Example.

	l.	*moneths.*		*l.*	*moneths.*		*l.*	*moneths.*
A.	40.	14	B.	50.	8.	C.	85.	6
	14			8			6	
	560			400			510	

If 1470 pound gaine 2345 pound, what will A. B. C. ſummes gaine them.

A.	560	893. 7		
B.	400	638. 2	21	
C.	510	813. 12		
		1		
	1470	2345	21	(1
			21	

The ſecond queſtion with more diuerſity of time, foure Merchants made a Company; A. put in 340 *li.* 19 *s.* 2 *d.* for 10 moneths; B. put in 930 *li.* for 9 moneths; C. put in 760 *li* for 12 moneths; D. put in 583 *li.* 13 *s.* 4 *d.* for 5 moneths, wherewith they gained 740 *li.* now the queſtion is, to know what each man muſt haue of this gaines.

Example.

	li.	*s.*	*d.*	*months.*
A.	340.	19.	2.	10.

20

6819

12 *d.*

13640
6819

81830

10 *month.*

818300

B. 930 *li.* 9. *moneths.*

9

8370

240

334800
16740

2008800 *pence.*

C. 760

C. 760*li.* 12. *moneths.*

240

30400
1520

182400
12 *months.*

2188800

D 583*li.* 13*s.* 4*d.* 5 *months.*

20

11673
12

23350
11673

140080
5 *moneths.*

700400

A.	8183 00
B.	20088 00
C.	21888 00
D.	7004 00
	5716300

Cut off two Cyphers from each number, and then worke as followeth.

If 57163 pence gaine 1776 pence, what will A.B.C.D. summes gaine them.

		l.	*s.*	*d.*	*d.*
A.	8183	105	18	7	4:5
B.	20088	260	00	11	3:5
C.	21888	283	6	11	4:5
D.	7004	90	13	4	4:5
			3	3	
The proofe.	57163	740	00	0	15:5 5(3

Example.

There is a Bootie or Spoyle taken by 3 men worth 7851 pound, and they agree to diuide it in this sort; A. is to haue one half, B. one third, C. one fourth; what is each mans share.

To

To worke this queſtion, and all other of like nature, ſeeke a number which may bee diuided by all the denominators of your three fractions in whole numbers, and the ſmaller ſuch a number bee that you chooſe, the more eaſie will your worke be; which for to find, multiply your denominators of your fractions one into another: that is to ſay, 2 by 3 makes 6; and 6 by 4, makes 24; ſo 12, one halfe of 24 will bee euenly diuided by all the three denominators, 2, 3 and 4. Wherefore I take 1:2 of 12 is 6, and 1:3 of 12 is 4, and 1:4 of 12 is 3; which added into one ſumme, makes 13 for firſt number in the Golden Rule; the ſecond is 7851 pound, and the third numbers are each ſeuerall mans portion imagined to be, *viz* 6, 4, 3, and then worke as before.

If 13 giue 7851 pound, what will A. B. C. ſummes giue

			li.		
A.	6	3623.	7		
B.	4	2415	9	13	
C.	3	1811	10		
		2			

The proofe. | 13 | 7851 | 26 (2
13

4. *Example.*

4. Example.

Foure Merchants bought a houſe together, which coſt 3000 pound; A. was to pay 1:2 and 6 pound ouerplus; B. 1:3 and 12 pound more; C. 8 pound leſſe then 2:3; D. 1:4 with 20 pound ouerplus. Now the queſtiõ is, what each Merchant muſt pay of this ſum. Anſwer: Firſt, the pounds ouerplus muſt be ſubtracted from the ſumme giuen; and the pounds wanting muſt bee added to the ſumme giuen; as for A. 6 pound, B. 12 pound, for D 20 pound, totall is 38 pound, to bee ſubtracted then; for C. adde 8 pound, therefore ſubtract 30 pound from 3000 pound, there wil remaine 2970 pound; then worke by the Rule of Fellowſhip, taking 12 for a number, which will bee diuided by all the denominators, 2, 3 and 4, *viz.* take for A. 6, for B 4, for C. 8, for D 3: totall is 21 for diuiſor, the ſecond number is 2970 pound, the third, each mans part imagined.

Example.

Example.

If 21 giue 2970 pound, what will A.B. C.D. ſummes giue.

A.	6	848	4:7	854. 4
B.	4	565	5:7	577. 5
C.	8	1131	3:7	1123. 3
D.	3	424	2:7	444. 2
		2		2
21	2970.	24(2	3000.	24(2
The proofe.		7		7

The numbers found to A. are 848 pound 4:7, to which if you adde 6 pound, makes 854 pound, 4:7.

To B 565 pound, to which 12 pound added, makes 577 pound, 5:7

To C. 1131 pound, 3:7, from which ſubtract 8, leaues 1123 pound, 3:7

To D. 424 pound, 2:7, to which adde 20 pound, makes 444 pound, 2:7; the which added into one total, makes 3000 pound, the proofe.

And in this manner may infinite varietie of queſtions bee propounded, and their doubts eaſily reſolued; and here will I ende concerning

conceruing this Rule, and goe in hand with ſome pleaſant queſtions to bee wrought by poſition, which is the moſt excellent Rule of all others in Arithmatick, as ſhal appeare in the ſecond part of this Booke in Decimall Arithmatick.

Poſition.

The Rule of Poſition requiring one number to bee imagined, before the principall proportion can be found.

TO worke by this Rule; Take any number at pleaſure, which you ſhall imagine to be the true number ſought, and proceed with it, as if it were the true number, wherein if you haue failed, by doubling or tripling according to the nature of the queſtion, you ſhall then attaine vnto the true number deſired, by aide of the Golden Rule, in manner following: for looke what proportion is betweene the falſe concluſion, and the falſe poſition, ſuch proportion hath the giuen number, to the number ſought.

Example.

Example:

A.B. and *C.* conſent to buy a ſhip, which will coſt them 2700 pound, ſo that *B.* muſt pay twice ſo much as *A*, and *C.* muſt pay 4 times ſo much as *B*: the queſtion is, what each man muſt pay of this ſumme? I ſuppoſe *A* muſt pay 8 pound, then *B* muſt pay twice as much as *A*, which is 16 pound; then *C* muſt pay 64 pound, which is 4 times as much as *B*: but yet 8 pound, 16 pound, and 64 pound, is but 88 pound, and it ſhould be 2700 pound, ſo that now I reſort to the Golden Rule, and worke as followeth. If 88 pound come of my Poſition 8 pound, of what comes 2700? Multiply 2700 by 8, and then diuide by 88, makes 245 pound 40:88, or 5:11 of a pound for the part that *A* muſt pay; then *B* muſt pay 490 pound, 10:11 of a pound, which is twice as much as *A*; and *C* muſt pay 1960 pound, 40:11 of a pound, which is 4 times as much as *B*. The totall ſumme is 2700 pound. Behold worke as followeth.

If

If 88 pound come of 8 pound, of what comes 2700.

```
  44
 4080      l.
21600 (245   40:88, or 5:11
 8888
   88
```

2700
8

21600

2. Example.

A Captaine of a Band of Men being asked, what number of Souldiers were in his Band, answered, I doe not readily know; yet (quoth he) of this I am certaine, that the 1:2 and 2:3, and 4:5, and 1:6 of their number added together into one sum, are 384 men: now the question is, what summe of men he had in his Band. I suppose he had 60 men, or 30 men in his Band but the least number is best, *viz.* 30, whereof 1:2 is 15, and 2:3 is 20, and 4:5 is 24, also 1:6 is 5, their totall is but 64 men, but that should be 384 men. Then say by the Golden Rule, as followeth.

If

If 64 come of 30, of what number comes 384.

384	520 *men.*
30	11520 (180
11520	6444.
	68

Answere: hee had 180 men in his Band, whereof

1 : 2 is 90 men,
2 : 3 is 120,
4 : 5 is 144,
1 : 6 is 30,

Totall is 384 *men.*

The solution of this Question another way more briefe.

Diuide 384 by 64, makes 6; which multiply by 30, makes 180 men, as before.

3. *Example.*

A certaine man hauing spent 120 pound, had yet remaining 1:2 and 1:3 of his whole substance; the question is, what his substance was. Answere: First, 1:2 and 1:3

is 5:6, which being taken from 6:6, the whole substance leaues remaining 1:6; therefore if 1:6 be 40 pound, what is 6:6? makes 240 pound.

li.

40
6

240

4. *Example.*

A Merchant bought 384 yards of broad Cloth of three seuerall prices, of each a like quantitie, and he was to pay halfe as much more for the second sort, as he payed for the first, and twice as much for the third sort as he payed for the second: now the question is, what each sort cost him, and at what price euery yard was rated vnto him? I suppose the first sort cost him 4 pound, then the second sort must cost him 6 pound, which is halfe as much more as the first; and then the third sort cost him 12 pound, which is twice as much as the second; the totall is but 22 pound, but it should be 248 pound: wherefore if 22 pound come of 4 pound, of what number comes 248 pound?

Example.

Example.

11		248 *li.*
992 (45.	1:11	4
222		
2		992

The first cost him 45 pound, 1:11 of a pound; then the second sort cost 67 pound, 7:11 of a pound; the third sort cost 135 pound, 3:11 of a pound, total is 248 pound: then diuide 384 by 3, and you shall find hee had 128 yards of each sort, and by Practise, you shall find the first sort cost 7 shillings, 1:2 *d.* a yard, the second sort cost 10 shillings 7 pence a yard almost, the third sort cost 21 shillings, 1 penny, 1:2 *d.*

Double Position.

The Rule of double Position.

SVppose a number at pleasure, as in the last Rule of single Position, and proceed as if you had found the right number, and if by working you find the true number, then your Position was the right number, which doth seldome happen. First, if by your working there commeth out more then the true number, then note it thus -|- with a crosse; if lesse, then thus —— with a long line, which doth signifie lesse.

Secondly, suppose another number, greater or smaller, and worke as before, vntill you doe find the true number sought; which if you doe not find, see the difference also from the true number sought, and note it with the signe -|- or —— as it shall bee found.

Then thirdly, set your suppositions with their errours, more or lesse, as in the examples following.

Fourthly, multiply crosse the first position

on by the ſeconds errour, and the ſecond poſition by the errour of the firſt, and then if the ſignes be both alike -|- or ——, abate the leſſer from the greater, and the remaines ſhall be the diuidend. Alſo the leſſer error abated from the greater, leaues the diuiſor; but if the ſignes be contrary one -|-, the other leſſe, add both together to make the diuidend, and adde the two errors to make the diuiſor: and laſtly, diuide the diuidend by the diuiſor, and the quotient is the true number deſired.

1. *Example.*

A certaine man ſeeing a purſe in his friends hand, ſaith vnto him: It ſeemeth vnto me, that there is 100 Crownes in your purſe To whom the other anſwered: Nay (quoth hee) there are not 100 Crownes, but (ſaith he) if they were increaſed 1:2 and 1:3, and 1:4, and laſtly, one Crowne ouerplus, then would they be iuſt 100 crownes.

I ſuppoſe there were 12 Crownes in his purſe, to which if I adde one halfe, of 12, which is 6; and one third of 12, which is 4; and one fourth of 12, which is 3; and laſtly, one Crowne more, the totall will be but 26

Crownes, but they should be 100 Crownes, so that this errour is two little by 74 Crownes, which I note thus:

74 —— 12

Secondly, I suppose he had 24 Crownes, to which I adde 1:2 of 24, which is 12 and 1:3, which is 8 and 1:4, which is 6: and lastly, one Crowne ouerplus, the totall is 51, but it should bee 100 Crownes, so that this is an errour of 49, too little, which I also note thus: 49 —— 24

588	74	49
74 —— 12	24	12
49 —— 24		
1776	296	98
588	148	49
1188	1776	588

74	~~1~~13	
49	~~11~~88 (47.	13:25
	~~2~~55	
25	2	

The

The anſwere is; that hee had 47 pound 13:25 parts of a pound in his purſe. The proofe followeth.

1 : 2 of 47 *li.* 13:25 of a *li.* is	23:19	25
1 : 3 is	15:21	
1 : 4 is	11:22	
and one Crowne ouerplus is	1:00	
	47:13	
The proofe.	100:75	

2. Example.

Twenty yards of Sattin, and 12 ſhillings is equall vnto 12 yards of veluet leſſe, 10 ſhillings; the price of either ſort is required.

To anſwere this, or any other like queſtion, take any number for the price of a yard of the leſſer number, which here is veluet, which at 20 ſhillings a yard, leſſe 10 ſhillings, amounteth vnto 230 ſhillings. Now admit a yard of Sattin at 14 ſhillings, ſo 20 yards and 12 ſhillings amounteth vnto 292 ſhillings; from which ſubtract 230 ſhillings, reſts 62 *s.* more then the truth. A-

Againe, rate a yard at 12 shillings, so the 20 yards and 12 shillings makes 252 shillings; from which take 230 shillings, rests 22 shillings more then the truth also. Now multiplying 22 by 14, and 62 by 12, the productes are 308, and 744, and the difference of those numbers is 436: then take 22 from 62, rests 40 for diuisor, by which diuide the difference, makes 10 shillings, 9:10 shillings for the price of a yard of Sattin.

Example.

62	
22	12
14	
124	*Difference.*
88	14 -|- 62 *Diuisor.*
22	62 2 40
	12 -|- 22
308	744
	308
	436

s.	s.
436 (10.	9:10
440	

3. *Example.*

3. *Example.*

Otherwaies if 40, the difference of errors gaine 2, the difference of positions, then 62 the first error yeelds 3 and 1:10

Or if 40 yeeld 2, what 22? makes 1 and 1:10; this taken from 12, or 3, 1:10 from 14, leaues 10, 9:10 for the price, as before.

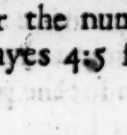
4. *Example.*

A Carpenter was hired to work 20 daies at 12 pence a day, but euery day that hee was idle, hee was to abate 18 pence of his wages, and in the end he receiued but 8 shillings: now the question is, how many daies he wrought.

First, suppose he wrought 12 daies, which commeth to 12 shillings, then must the 8 dayes that hee played, come to 12 shillings at 18 pence a day also: but this question saith, there came due to him 8 shillings? Behold an error of 8 shillings too little.

Againe, I say that he wrought 14 dayes, amounting to 14 shillings: then 6 dayes that he played at 18 pence a day, commeth to 9 shillings; this taken from 14 shillings,

leaues 5 shillings, and it should bee 8 shillings, which is an errour of 3 shillings too little. Now multiplying 12 by 3, and 14 by 8, the products are 36. and 112, and the excesse is 76; which being diuided by 5, the difference of the errours, quoteth out 15, 1:5 for the number of working dayes, and 4 dayes 4:5 for the number of playing dayes.



Otherwayes.

If 5 the difference of errours, yeeld 2, the difference of positions, what 8 the first errour? makes 3, 1:5 to be added to 12.

Or if 5 be 2, what is 3? makes 1, 1:5 to be added to the second position 14, whereby all three wayes the numbers of the Dayes he wrought are found out.

Barter

Barter or Exchange.

TWo men barter, one hath Ginger of 10 pence a pound ready money, & in barter hee will ſell it for 12 pence a pound. The other hath ſugar of 12 pence a pound ready money, but in barter hee will ſell it for 14 pence a pound; the Queſtion is, how much Sugar will pay for 756 pound of Ginger? Firſt, put your price of your Ginger into pence, makes 9072 pence; which diuide by 14 pence, makes 648 pound of Sugar, which muſt be giuen for 756 pound of Ginger, at 12 pence the pound.

2. *Example.*

Two Merchants will barter, one hath Rayſons of 34 ſhillings the hundred readie money, and in barter hee will ſell them for 40 ſhillings: the other hath Nut-megs of 4 ſhillings the pound ready money, how ſhall he ſet his Nut-megs to make the like profit. Put your coyne into pence, and ſay; If 408 *d.* be 480 *d.* what is 48 *d.* Multiply 480 by 48, and diuide by 408, makes 56 *d.* 25;51 of one penny for the price of the Nutmegs; *vid* 4 *s.* 8 *d.* 1:2 of a pound.

3. *Example*

3. Example.

Two Merchants wil barter, one hath Holland of 2 ſhillings, 7 pence the ell ready money, which he will ſell in barter for 2 ſhillings, 10 pence the ell, and yet he wil gaine priuately 10 pound in 100 pound ouer that gaine; at what price muſt hee then ſet his Holland? Anſwere: Set downe 2 ſhillings 10 pence in pence, makes 34 pence; of which take the tenth part, which is 3 pence, 4:10, or 2:5, and adde to 34 pence, makes 37 pence 2:5 of a penny for the price, to ſell one ell to make that gaines. Now the other Merchant hath wooll at 7 ſhillings a Todde ready money, how ſhall he ſet his wooll to make like profit that he be not deceiued in the bargaine. If 31 pence be 37 pence, 2:5, what is 84 pence? Multiply 374 primes by 84, makes 31416; which diuide by 31, makes 101 pence, 3:10 penny, or 8 ſhillings, 5 pence, 3:10 of one penny, which is the price for him to ſell his wooll to make like profit.

Example

Example.

```
                    1
                  374
   34              84
   34          ------
  ----           1496
  374           2992
                ------
                31416
```

```
    1
   103      d.
 31416 (101.  3:10 of 1 penny.
 31111
  333
```

4. *Example.*

Two Merchants will barter, one hath Sugar of 6 pound, 4 ſhillings ready money, and he will ſell it for 7 pound the hundred. The other hath Ginger of 4 pound, 6 ſhillings the hundred, and in barter he will ſell it for 5 pound the hundred; now the queſtion is, at what rate each of them doth gaine *per cent'* and which hath the aduantage of the other.

Firſt,

Firſt, if 6 pound, 2 primes gaine 8 primes, what will 100 pound gaine? Multiply 8 primes by 100, makes 800 primes; then ad 2. or 3 cyphers more to it, which diuide by 6:2 primes, makes 12 *l.* 9 primes, 10:31 of a prime, or neare 12 *l.* 18 ſhillings, 8 pence, which the firſt man doth gaine *per cent'.*

Secondly, if 4 pound, 3 primes gaine 7 primes, what will 100 pound gaine? Multiply 7 primes by 100, and adde 2 cyphers more, makes 70000; which diuide by 4:3 primes, makes 16 pound, 2 primes, 34:43 of a prime; from which ſubtract 12 pound, 18 ſhillings, 8 pence, reſts 3 pound, 6 ſhillings, 2 pence, which the ſecond man hath gained more then the firſt gained.

6. Example.

Two Merchants barter, one hath a certaine number of pieces of Sakkins at 18 ſhillings a piece, for the which the other doth giue him 1806 ells of linnen Cloth, at 16 pence the ell, and yet 30 pound in readie money; the Queſtion is, how many pieces of Sakkin he had. Firſt, find what 1806 ells of linnen Cloth coſt by Practice? makes 120 pound, 8 ſhillings: to the which adde

30 pound

30 pound, makes 150 pound, 8 ſhillings; then diuide 150 pound, 4 primes, by 18 ſhillings, or 9 primes, makes 167 pieces of Sakkin, and 1:9 of a piece.

Example.

```
 3          l.  1
18060(120.  4
15555   30
        ----
        150.  4
```

```
 661  Pieces.  Pieces
1504 (167.  1:9
 999
```

6. Example.

Two men will barter, one hath Pepper of 22 pence the pound ready mony, but in barter hee will ſell it for 27 pence the pound: the other hath Sinamond of 3 ſhilling, 6 pence the pound readie monie, and in barter hee will ſell it for 4 ſhilling the pound; the queſtion is, how much ſinamond wil pay for

for 384 pound of Pepper at that rate? First, 384 pound of Pepper at 27 pence the pound is 43 pound, 4 ſhillings; which diuide 43:2 primes, makes 216 pound Sinamond, which he muſt giue.

7. Example.

If 4 Engliſh ells make 5 yards, and 13 yards, makes 50 Pawnes at Geanes, how many Pawnes is in 100 ells Engliſh. If 5 be 4, what is 13, makes 10 2:5. Secondly, if 10 2:5 be 50, what is 100, 480 10:13

8. Examples.

Euery 4 ells at *Antwerpe* maketh 5 at *Frankford*, and 25 there makes 24 Braces at *Luques*, the queſtion is, how many braces is 100 in *Antwerpe*. If 25 bee 24, what is 5, makes 4 4:5. Secondly, if 4 bee 4 4:5, what are 100, makes 120.

9. Example.

If 3 yards at *London* be 4 ells at *Antwerpe*, how many yards at *London* make 84 ells at *Antwerpe*. If 4 be 3, what 84? makes 63 ells.

10 *Exam-*

10. *Example.*

At *Roan* 112 ells make but 98, and 100 ells at *Roan* is 112 at *Siuil*, how many of ours in 100 ells of *Siuill*. If 98 *Roan* be 112 ells, what 100 *Roan*, makes 114 ells, 1:7 of an ell. Secondly, if 112 ells be 114, 1:7, what is 100 *Siuill*, makes 102, 19:25.

11. *Example.*

If 67 yards at *London* bee 100 in *Venice*; how many are 7894? multiply by 67, makes 5288 yards, 98:100 parts.

12. *Example.*

A Merchant doth deliuer 400 pound ſterling in *London* by exchange for *Antwerpe*, at 23 ſhillings, 5 pence the pound ſterling, the queſtion is how much Flemiſh money, hee ſhall receiue at *Antwerpe*: put your 23 *s.* 5 *d.* into pence, makes 281 pence; which multiply by 400, makes 112400 pence; which diuide by 240, makes 468 pound, 6 ſhillings, 8 pence, which he muſt receiue at *Antwerpe*.

Example.

Example.

s.	d.
23.	5
12	
276	
5	
281	

281
400
112400

z	d.
26088	
2224000	(468.
244440	
222	

l.	s.	d.
468.	3.	8

13. *Example.*

If 100 pound ſtarling be 134 pound, 6 ſhillings, 4 pence Flemmiſh, what is one pound ſtarling worth? Reduce your coine 134 *l.* 6 *s.* 4 pence, into pence makes 32236; which diuided by 100, makes 322 pence, 9:25 pence, or 26 ſhillings, 10 pence, 9:25 of one penny, for one pound ſterling.

If one pound ſterling be 1 pound, 14 ſhil-

ling

lings,7 pence,ob. Flemish, how much sterling money is in 100 *li.* Flemmish? Reduce 100 pound into pence, makes 24000 pence; then put it into halfe pence, makes 48000 halfe pence; then put 1 pound, 14 shillings, 7 pence, *ob.* into half pence,makes 831; by which diuide 48000, makes 57 pound, 15 shillings,1 penny almost, and so much sterling money is in 100 pound of Flemish money at that rate.

Of Gaine and Losse.

IF 13 pieces of Canuas cost 17 pound, 12 shillings, how may I sell them to gaine 8 pound in the hundred? Multiply 176|600 by 8, makes 19 pound, 19|008, or two pence almost,and so much must he sell them for to gaine 8 pound in the hundred.

If 17 pound, 12 shillings gaine 1 pound, 8 shillings, 2 pence, what will 100 pound gaine? Multiply 1 pound, 8 shillings, 2 pence in Decimalls by 100, and diuide by 17 pound, 6 primes, makes 8 pound in the 100,the proofe.

Example.

```
17600
....8          1408 (8 li.
------          176
 1408
------
19|008
```

A Merchant hath lent 630 pound at interest for 10 pound in the 100 for 3 yeeres interest vpon interest, the Question is, vnto what summe it will amount vnto at the end of the terme? Answere: Take the tenth part, and adde it into one totall 3 seuerall times, makes 838 pound, 10 shillings, 7 pence, 1:5 of a penny for principall and interest, at the rate giuen, to bee paid at the end of three yeares.

Example.

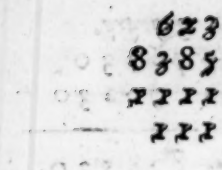
Example.

1. yeare.	2. yeares.	3. yeare.
630	6930	76230
630	6930	76230
693|0	7623|30	838|530

2. Example.

A Merchant receiueth for principall and intereſt 838 pound, 10 ſhillings, 7 pence, 1:5 of a penny at 10 pound in the hundred compound intereſt, which was for money deliuered out for 3 yeares; now the Queſtion is, what was the ſumme of money that was lent? To doe this, or any other the like queſtion, diuide the ſumme of mony receiued by 110 three ſeuerall times, and the three quotients will ſhew the yearely increaſe of the money lent, and the laſt quotient will be the anſwere to the queſtion, or the money disburſed, as in the example following, which is the proofe of the former queſtion.

Example.



3. *Example.*

A Merchant lent 100 pound for 7 yeares at 10 pound in the hundred Compound Interest, the Question is, what he shall receiue at the end of the terme.

Example.

100|
10|0

——————one yeare 100 *li.*

110|0
11|00

——————2 yeares, 121 *li.*

121|00
12|100

——————3. yeare 133 *li.* 2 *s.* 0 *d.*

133|100
13|3100

——————4. yeare 146 *l.* 8. *s.* 2. *d.* $\frac{2}{5}$

146|4100
14|64100

——————5 yeare 161 *li.* 1 *s.*

161|05100
16|105100

——————6 yeare 177 *li.* 3 *s.* 1 *d. ob.*

177|156100
17|71561

——————7 yeare 194 *l.* 17 *s.* 5 *d.*

194|871710

Makes at 7 yeares end 194 *li.* 17 *s.* 5 *d.*

How to worke Compound intereſt at any rate per cent'.

What is the principall and intereſt of 352 pound, put out at 8 pound in the hundred compound Intereſt, to be paid at the end of two yeares? Adde two cyphers to 352 pound, makes 35200; then place your Intereſt 8 vnder the loweſt cypher next the right hand, and multiply 352 by 8, placing the product vnder the line, and that will be the Intereſt; which added into the ſumme lent, makes the totall of the principall and intereſt, and ſo worke for the ſecond, third, and fourth yeare, as in the Example.

1. yeare.	
35200	3801600
....8	8
2816	304128
380|16	410|5728

or 380 *li.* 3 *s.* 2 *d.* 2 : 5 *d.*] or 410 *li.* 11 *s.* 5 *d.*

First,

First I multiply 35200 by 8, makes 2816, which I adde vnto 35200, makes 38016; then I multiply 3801600 by 8, makes 410|5728, or 11 shillings, 5 pence, abating 4 figures for the 4 cyphers, which I added to the summe for to find out the prime line, as appeareth in the example; and so of any other summe or rate in the hundred.

At 17 pound the hundred *per annum* compound interest, what wil 879 pound amount vnto to bee all forborne vnto the end of 5 yeares? Adde 2 cyphers to your summe giuen, and multiply by your Interest 17, and adde into the principall, and so worke 5 yeares, and the last product will bee the summe of money to bee receiued, *viz.* 1927 pound, 3 shillings, 5 pence.

Example.

87900
17

5463
869
79

First yeare.

1028|4300
17

171|9901
2|843

2 yeares.

1203|263100
17

184228417
2032631

Three yeare.

1407|81782700
17

1985|47247897
407|81782

Foure yeares.

1647|14685759 00

1647 &c.

1647	1468575900
	17
115	3002800313
164	714685759
1927	1618233803

fiue yeares

li.	*s.*	*d.*
1927.	3.	5.

If a Merchant buy a parcell of Holland, at 3 pound, 6 shillings the piece; and another parcel at 4 pound, 2 shillings the piece; the third sort at 4 pound 10 shillings the piece, the fourth sort at 5 pound the piece; how may he sell 40 pieces, of each sort 10 pieces to gaine 18 pound in the hundred, and giue 9 moneths time for the payment; as in the Example following.

Example.

Example.

10 Pieces at	3.	6.	a piece,	33.	0.
10 Pieces at	4.	2.	a piece,	41.	0.
10 Pieces at	4.	10.	a piece,	45.	0.
10 Pieces at	5.	0.	a piece.	50.	0.
			The summe is	169.	0.

16900
18

1352
169

199|4

Take the 3:4 of the intereſt, makes 191 pound, 16 ſhillings, 3 pence, 3:5 of one penny, to ſell to gaine 18 pound in the hundred, for to giue 9 moneths time.

A Merchant ſold 300 quarters of wheat, coſt him 352 pound ready money, and loſt 7 pound in the hundred, what did one quarter coſt him, and at what rate did he ſell a quarter, to looſe 7 pound in the hundred? Take the intereſt at 7 pound in the hundred

dred, which is 24 pound, 12 shillings, 9 pence, 3:5, which subtract from 352 *li.* makes 327 pound, 7 shillings, 2 pence, 2:5 of a penny, and diuide the remainer by 300, makes 1 pound, 1 shilling, 10 pence for the price sold: secondly, diuide 352 pound by 300, makes 1 pound, 3 shillings, 5 pence *ob.* for the price which it cost him

Rie sold for 3 shillings a bushell looseth 20 pound in the hundred, what will then be lost, if it bee sold for 3 shillings 6 pence a bushell? If 3 shillings be 80 pound, what is 3 shillings 6 pence? Multiply 80 pound by 3 1:2, or by 3 shillings, 6 pence, makes 2800; which diuide by 3, makes 93 *li.* 1:3 Or otherwise, if 36 pence bee 80 pound, what is 42 pence? Multiply 80 by 42, and diuide by 36, makes 93 pound 1:3 of a pound as before.

If in one ell of Cloth sold for 3 shillings, 2 pence, there were gained after the rate of 10 pound in the hundred, what did that ell of cloth cost? diuide 385, or 38 penny 1:2 by 110, makes 35 pence that the ell cost.

```
  5
3850(35 d.
1100
 11
```

If

If one yard of Holland cloth cost 2 shillings, 11 pence, how many yards shall I buy for 34 pound, 6 shillings, put it into pence, makes 8232 pence; which diuide by 35 pence, makes 235 yards, 1:5 yard.

How to gaine any rate in the Hundred you desire.

Put your price that one yard, ell, pound or piece doth cost you into pence; and then for 10 pound in the hundred, take the tenth part of that summe, which is the same number, placed one place nearer to the right hand, and that is the profit or Interest; which added vp into the price giuen, makes the price to sel one yard, pound, ell, or piece, to gaine 10 pound in the hundred ready money.

Example.

If one ell of Holland cloth cost 3 shillings, 9 pence, how may I sell to gaine 10 pound *per cent'* ready money? Put 3 shillings 9 pence into pence, makes 45 pence: then take the tenth part of 45 pence, which is 4 pence 5:10, or one half, makes 49 *d.* 1:2 for the price to sell an ell to gaine 10 *li. per cent.*

Example.

Example.

d.		*s.*	*d.*	*d.*
45	makes	4.	1.	1:2
45				
	d.			
	74		*s.*	*d.* *d.*
49|5	7|4	makes	6.	9. 2:5
	81|4			

If your price you would gaine, bee not 10 pound in hundred, then adde 2 Cyphers to your number of pence giuen and multiply that number by your Intereſt, omitting to multiply by the cyphers, and the product vnder the line is your Intereſt or gaine, which added vp into one ſumme; makes the price to ſell one yard, ell, pound, or piece; to gain according to the rate deſired example.

If one pound of Cloues coſt 4 ſhillings, 10 pence, how may I ſell to gaine 9 pound *per cent* ready money? Put 4 *s.* 10 *d.* into pence, makes 58 *d.* then ad 2 cyphers, makes 5800; which multiply by 9, makes 5:22 or 5 pence, 22:100 parts of one penny; which added vp to the vpper numbers, is 63 pence, 22:100 parts of one penny, or 5 ſhillings,

ſhillings, 3 pence, 1:5 of a penny for the price to ſell one, to gaine 9 pound in the hundred.

At 9 pound in the hundred.	At 12 pound in the hundred.
5800	47|00
...9	12
522	494
	7
6322	52|64
or 5 *s.* 3 *d.* 22:100.	or 4 *s.* 2 *d.* 16:25 *d.*

If one piece of Rayſons coſt 18 ſhillings, 9 pence, how may I ſell to gaine 18 pound in the hundred ready money? put your money into pence, makes 225 pence, to which adde 2 cyphers, makes 22500; which multiply by 18, makes 40:50, or 40 pence, *ob.* which added into the price, makes 265 pence, *ob.* for the price to ſell one piece to gaine 18 pound in the hundred.

Example.

Example.

225|00
...|18

18|00
22|5

265|50

21
265(225.1 *d.ob.* for the price of one piece.
222
1

A Merchant lent wares for 10 pound in the hundred profit for 12 moneths, and at the end of 6 moneths he receiued principall and intereſt 356 *li.* the queſtion is, what was the ſumme lent? Anſwere: adde 2 cyphers to 356 pound, and diuide by 105 pound, which is 6 moneths intereſt and principall, makes 339 pound 1:21 parts of a pound for the ſum lent.

Example.

Example.

9
4 x 5 5 li. li.
3 5 6 0 0 (3 3 9. 5 : 1 0 5
x 0 5 5 5
x 0 0
x

3 3 9 0 | 5
Intereſt for 3 3 9 | 0 5 yeeres.

Intereſt for 1 6 9 | 5 2 5 1 : 2 yeare.

The proofe. 3 5 6 | 0 0

Equation of Payment.

The Rule of payment is to bring diuers paymeues due at ſeuerall dayes to be payed at one intire payment.

A Merchant is to pay at diuers payments 600 pound: *viz.* 200 pound preſent, 200 pound at 8 moneths, 140 pound at 6 moneths,

moneths, and 60 pound at 2 moneths: now hee is willing to pay all at one payment, what time must be giuen? The ready mony being omitted, set the rest as numerators thus, 200:600 140:600 60:600 partes, which in their least termes abreuiated, makes 1:3 7:30 and 1:10. Now multiply 1:3 by 8, makes 2, and 2:3; secondly, 7:30 by 6, makes 1 and 2:5; thirdly, 1:10 by 2 makes 1:5; totall is 4 moneths, and 4:15 of a month for the time sought.

Examples.

200:8	3
105:7	5
15:1	5
320	75

2

320 (4 moneths, 20:75,
78

A Merchant hath owing him 752 pound, to be payd 200 pound content; 200 pound at 3 moneths, 130 pound at 5 moneths, and the rest at 12 moneths; now at what time ought this money to be payd all at one payment?

Example.

200:752	130:752	222:751
3	5	12
600	650	2664

2664
650
600
3914

15 *moneths. dayes.*
3914(5 6
752

A Merchant hath owing vnto him 782 pound, 12 ſhillings, to bee paid 1:3 at 4 moneths 1:2 at 7 moneths, the reſt at 12 moneths, what time muſt it bee all at one payment.

moneths.

1:3	4	1	1:3
1:2	7	3	1:2
1:6	12	2	0:0
		6	5:6

Makes 6 moneths, 5:6 of a moneth.

VVines worth 14 pound ready money are sold for 16 pound, to pay 1:3 at 3 moneths, 1:2 at 4 moneths, and the rest which is 1:6 at 12 moneths; the question is, what is gained in 100 pound in 12 moneths.

	moneths.		
1:3	3	1	0:0
1:2	4	2	0:0
1:6	12	2	0:0
		5	0:6

Makes at 5 pound in the hundred.

Sugars worth 21 pound ready money are sold for 25 pound, to pay 1:5 ready money, 1:8 at 4 moneths, 3:10 at 7 moneths, 3:8 at 15 moneths; the question is, at what rate *per cent' per annum* they were sold.

	moneths.		
1: 8	4	0	1: 2
3:10	7	2	1:10
3: 8	15	5	5: 8
		8	9:40

Makes 8 pound, 9:40 *per cent'*.

Alligation Mediall.

ALlegation is an Arte teaching to combine or knit together diuers things vnequally prised, and thereby to find an equall price of any part of the said mixture, Alligation Mediall, is that which by the augmenting the quantitie of euery seueral portion to be mixed by his owne price, and diuiding the summe of all the products by the totall of the seuerall portions to bee mixed, findeth the thing sought.

Example.

Three seueral sorts of Barly are to be mixed; *viz.* 34 bushels at 18 pence, and 76 at 20 pence, and 100 at 22 pence; the Question is, what one bushell of that mixture will be worth? First, multiply each number by his price, *viz.* 34 by 18, 76 by 20, and 100 by 22, makes 612, 1520, and 2200, the totall is 4332: then adde the number of bushells into one summe, makes 210; by which diuide 4332 *d.* makes 20 pence, 132:210 of one penny for the price of one bushell so mixed.

2. *Exam-*

2. *Example.*

If you will mixe 30 gallons of Sacke at 4 ſhillings a gallon, with 150 gallons of White Wine at 2 ſhillings the gallon, what will a gallon of that mixture bee worth? Multiply 30 by 4, makes 120 ſhillings; alſo 150 by 2 ſhillings, makes 300 ſhillings, totall is 420 ſhillings: then adde 30 and 150, makes 180 gallons; by which diuide 420 ſhillings, makes 2 ſhillings, 1:3 of a ſhilling, or 2 ſhillings, 4 pence, for the price of one gallon ſo mixed.

3. *Example.*

Admit there were 6 portion of Siluer of 7 ounces fine, 12 of 8 ounces fine, and 25 of 10 ounces fine, which are to bee mingled with 10 pound of Copper, what is a pound of that mixture worth? For anſwer: multiply 6 by 7, makes 42; alſo 12 by 8 makes 96, and 25 by 10, makes 250, the totall is 388, which being diuided by 53, the totall of 6, 12, 25 and 10 makes 7 ounces, 17:53 of an ounce; and ſo much fine is a pound of that mixture.

4. Example.

A Merchant hath 6 ſeuerall ſorts of Spices, of which he will ſell, of each an equall quantitie of ſeuerall prices for the ſumme of 323 pound, 8 ſhillings: *viz.* Sinamond large at 4 ſhillings, 6 pence a pound; Nutmegs Caſe at 3 ſhillings, 8 pence a pound; Large Maces at 8 ſhillings a pound; and Pepper Caſe at 2 ſhillings 2 pence a pound, Pepper Callico at 22 pence the pound, and Ginger large at 10 pence a pound; the Queſtion is, how many pound he muſt haue of each to make the iuſt ſumme of 323 pound, 8 ſhillings? Anſwer: firſt, put your money into ſhillings, makes 6468 ſhillings; ſecondly, put all your prices of the Spice into one ſumme, and by that ſumme, which is 21 ſhillings, diuide 6468, makes 308 pound which he muſt ſell of each.

Example.

Example.

	s.	*d.*
1	4.	6.
2	3.	8.
3	8.	0.
4	2.	2.
5	1.	10.
6	0.	10.
	21.	00.

x *l.*

6468 (308

xxxx

xx

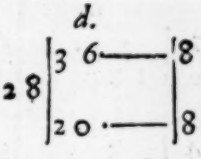
	li.	*s.*	*d.*
1	69.	6.	0.
2	123.	4.	0.
3	56.	9.	4.
4	33.	7.	4.
5	28.	4.	8.
6	12.	16.	8.
	323.	8.	0.

Alligation Alternat.

ALligation Alternat is that, which altereth the places of ſuch exceſſe as commonly fall betweene the meane price, and the extremes; in which counter-change, if the extremes be equall, then the difference betweene the meane price, & leſſer extreme is to be ſet againſt the greater extreme, and of the contrary if otherwiſe.

1. *Example.*

White Wine of 20 pence the gallon is to be mixed with Sacke of 3 ſhillings a gallon, ſo that there muſt be mixed 300 gallons to make the price to bee but 2 ſhillings, 4 pence the gallon, the queſtion is, how much of each ſort muſt bee taken The numbers ſet downe, as in this example thus, the difference of 20 the leſſer extreme from 28, is 8; alſo the difference of 36 the greater extreme is alſo 8, ſo that I find you muſt take as many of one ſort, as of the other to make this mixture: *viz.* 150 gallons of each ſort.



2. *Example.*

White Wine of 16 pence a gallon is to be mixed with Sack of 40 pence the gallon, how many gallons muſt bee taken of either ſort, ſo that 120 gallons may be of 30 pence the gallon.

The

The numbers being ſet downe, as in this example, the difference of 16 the leſſer extreme from 30 the meane price, there wil remaine 14, which I place againſt 40; then take the difference of 40, the greater extreme, from 30 the meane price, there will reſt 10 to be linked with the leſſer extreme; whereby I find, that ſo often as I take 14 gallons of Sacke I muſt take 10 gallons of White Wine to make the mixture: where for if 24 gallons be 120, what is

	40 —	14	
30			
	16 —	10	

14	70	
10	50	

3. *Example.*

A certaine Clothier is deſirous to mingle 144 pound of wooll of 4 ſorts: *viz.* blew wooll of 16 ſhillings the ſtone, red wooll of 11 ſhillings the ſtone, greene wooll of 12 ſhillings, white wooll of 9 ſhillings the ſtone, how many ſtones of each ſhal he take, that one ſtone of the mixture may be worth 14 ſhillings.

The

4. Example.

A Merchant hath 6 ſeuerall ſorts of Spices, of which he will ſell, of each an equall quantitie of ſeuerall prices for the ſumme of 323 pound, 8 ſhillings: *viz.* Sinamond large at 4 ſhillings, 6 pence a pound; Nutmegs Caſe at 3 ſhillings, 8 pence a pound; Large Maces at 8 ſhillings a pound; and Pepper Caſe at 2 ſhillings 2 pence a pound, Pepper Callico at 22 pence the pound, and Ginger large at 10 pence a pound; the Queſtion is, how many pound he muſt haue of each to make the iuſt ſumme of 323 pound, 8 ſhillings? Anſwer: firſt, put your money into ſhillings, makes 6468 ſhillings; ſecondly, put all your prices of the Spice into one ſumme, and by that ſumme, which is 21 ſhillings, diuide 6468, makes 308 pound which he muſt ſell of each.

Example.

Example.

	s.	*d.*
1	4.	6.
2	3.	8.
3	8.	0.
4	2.	2.
5	1.	10.
6	0.	10.
	21.	00.

x *l.*

6468 (308

xxxx

xx

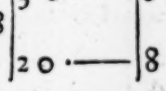
	li.	*s.*	*d.*
1	69.	6.	0.
2	123.	4.	0.
3	56.	9.	4.
4	33.	7.	4.
5	28.	4.	8.
6	12.	16.	8.
	323.	8.	0.

Alligation Alternat.

ALligation Alternat is that, which altereth the places of ſuch exceſſe as commonly fall betweene the meane price, and the extremes; in which counter-change, if the extremes be equall, then the difference betweene the meane price, & leſſer extreme is to be ſet againſt the greater extreme, and of the contrary if otherwiſe.

1. *Example.*

White Wine of 20 pence the gallon is to be mixed with Sacke of 3 ſhillings a gallon, ſo that there muſt be mixed 300 gallons to make the price to bee but 2 ſhillings, 4 pence the gallon, the queſtion is, how much of each ſort muſt bee taken The numbers ſet downe, as in this example thus, the difference of 20 the leſſer extreme from 28, is 8; alſo the difference of 36 the greater extreme is alſo 8, ſo that I find you muſt take as many of one ſort, as of the other to make this mixture: *viz.* 150 gallons of each ſort.



2. *Example.*

White Wine of 16 pence a gallon is to be mixed with Sack of 40 pence the gallon, how many gallons muſt bee taken of either ſort, ſo that 120 gallons may be of 30 pence the gallon.

The

The numbers being ſet downe, as in this example, the difference of 16 the leſſer extreme from 30 the meane price, there wil remaine 14, which I place againſt 40; then take the difference of 40, the greater extreme, from 30 the meane price, there will reſt 10 to be linked with the leſſer extreme; whereby I find, that ſo often as I take 14 gallons of Sacke I muſt take 10 gallons of White Wine to make the mixture: where for if 24 gallons be 120, what is ——————

30	40—	14
	16—	10

	14	70
	10	50

3. *Example.*

A certaine Clothier is deſirous to mingle 144 pound of wooll of 4 ſorts: *viz.* blew wooll of 16 ſhillings the ſtone, red wooll of 11 ſhillings the ſtone, greene wooll of 12 ſhillings, white wooll of 9 ſhillings the ſtone, how many ſtones of each ſhal he take, that one ſtone of the mixture may be worth 14 ſhillings.

The

The counter-change being made, according to the Rule, as is in the Margent, it is plaine, that so often as you take 5 of Blew, you must take 3 of Greene, and 2 of Red, and 2 of VVhite. Therefore if 12 bee 144, what

14	16.	5	
	12.	3	
	11.	2	
	9.	2	

is	5.	10
	3.	36
	2.	24
	2.	24

The end of the first Booke.

THE SECOND BOOKE.

Containing a Treatiſe of Decimall Arithmatick:

Wherein is taught how to work all manner of operations in Decimall Arithmatick, more ſpeedy and *eaſie, then by vulgar Arithmatick*; and firſt of the Decimall Table.

LONDON,
Printed by *Auguſtine Matthewes* dwelling in the Parſonage-houſe in Saint *Brides* lane, neere Fleetſtreet.
1623.

THE SECOND BOOK

THE VSE OF THE Decimall Table.

THe Decimall Table following doth begin from one Farthing vnto a Prime, or two Shillings; so that if you haue a Decimall Fraction giuen, which doth containe 90625 sixths: search it in the Decimall Table; and you shall find it ouer against 21 pence, three farthings and that is the value of that fraction giuen.

Or if you would know how to set out 16 pence halfe-penny in Decimalls; search in the Table against 16 *d.* 2 *q.* and you shall find 6875 fifthes for the decimall sought.

But if you would set out any number of shillings from one shilling vnto one pound, or 20 shillings; search in this little Table following, and you shall find your desire. As if you would set out 15 shillings in Decimalls, you shall find 7 primes, 5 seconds for 15 shillings, and so of any other summe, as in the example following.

Example.

Shill.	1.2
1	05
2	10
3	15
4	20
5	25
6	30
7	35
8	40
9	45
10	50
11	55
12	60
13	65
14	70
15	75
16	80
17	85
18	90
19	95
20	1li.

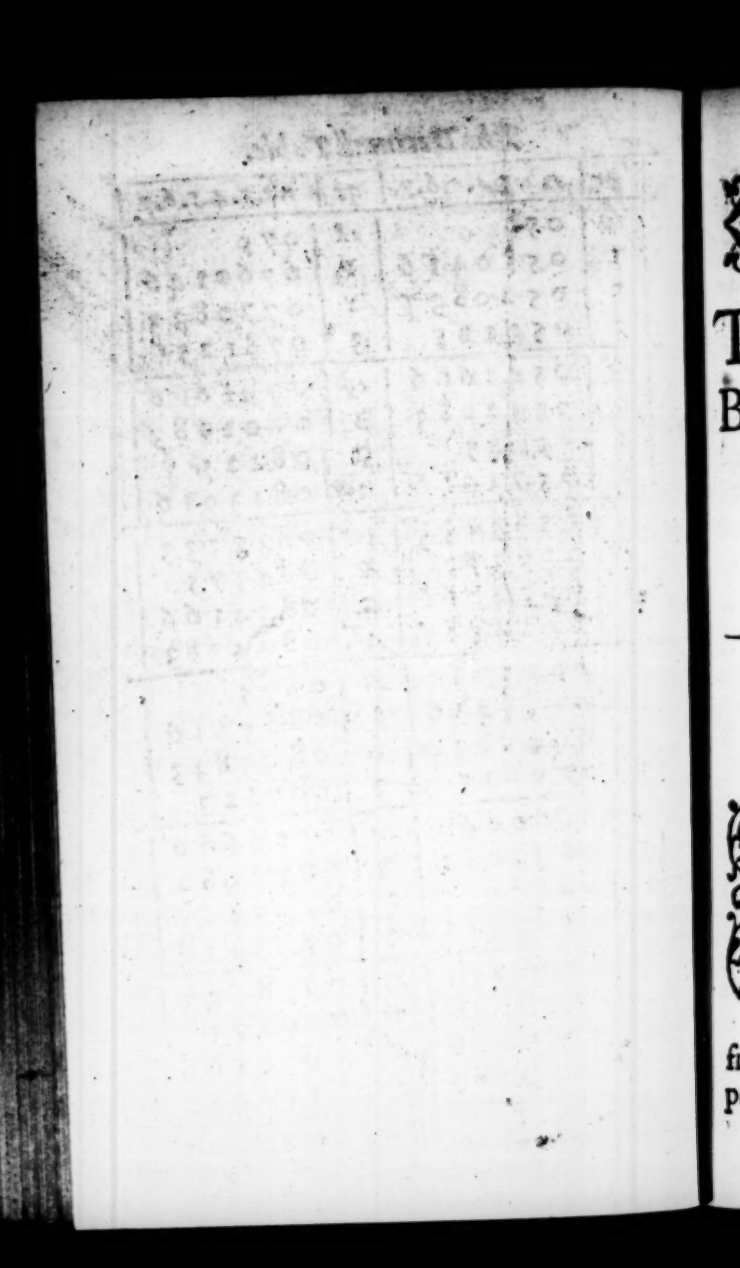
The

The Decimall Table.

q.	1.2.3.4.5.6.7	q.	1.2.3.4.5.6.7
1	0010416	6	025
2	0020833	1	0260146
3	003125	2	0270833
		3	028125
1	0041666	7	0291666
1	0052083	1	0302083
2	00625	2	03125
3	0072916	3	0322916
2	0083333	8	0333333
1	009375	1	034375
2	0104166	2	0354166
3	0114583	3	0364583
3	0125	9	0375
1	0135416	1	0385416
2	0145833	2	0395833
3	015625	3	040625
4	0166666	10	0416666
1	0177082	1	0427082
2	01875	2	04375
3	0197916	3	0447916
5	0208333	11	0458333
1	0218746	1	046875
2	0229166	2	0479166
3	0239582	3	0489584
6	025	12	05

The Decimall Table.

q.	1.2.3.4.5.6.7	q.	1.2.3.4.5.6.7
12	05	18	075
1	0510416	1	0760146
2	0520833	2	0770833
3	053125	3	078125
13	0541666	19	0791666
1	0552083	1	0802083
2	05625	2	08125
3	0572916	3	0822916
14	0583333	20	0833333
1	059375	1	084375
2	0604166	2	0854166
3	0614583	3	0864583
15	0625	21	0875
1	0635416	1	0885416
2	0645833	2	0895833
3	065625	3	090625
16	0666666	22	0916666
1	0677082	1	0927082
2	06875	2	09375
3	0697916	3	0947916
17	0708333	23	0958333
1	0718746	1	096875
2	0729166	2	0979166
3	0739582	3	0989584
18	075	24	1000000



THE SECOND BOOKE, CONTAINING A TREATISE of Decimall Arithmatick.

The declaration of the parts of the Decimall Table.

FIrſt, the Decimall Table in the left Margent containes certaine numbers in great and ſmall letters; firſt, from 1 farthing vnto one prime, or tenth of a pound, or two ſhillings. Then from one prime for euery ſhilling vnto one pound ſtarling, or 20 ſhillings.

Firſt, beginning in the left margent is ſet

ſet downe one farthing in the vttermoſt paralell to the left hand, in the firſt paralell of the Table, and ſo continuing from one farthing to one prime, or 2 ſhillings; and ouer againſt euery number in the left ſide in a right line towards the right hand is contained the numbers in decimals, anſwering vnto euery farthing from one farthing to one prime, or 2 ſhillings; and in the vpper margent in the head of the Table is contained, the true denominations of the ſaid areall numbers in primes, ſeconds, thirds, fourths, fifths, ſixths, and ſeuenths, which are ſmall enough to worke any queſtion exact to a ſmall fraction of one penny in a ſumme of great value, as ſhall appeare by examples following. But here you ſhall note, that all the numbers in the ſaid Table cannot be exact and perfit.

To find the value of a Decimall fraction in the parts of Coyne.

Suppoſe the number giuen to bee 2 ſeconds, 4 thirds, 5 fourths, and 7 fifthes, and you deſire to know the true value thereof in coyne; ſet downe your numbers, as in the example following, and marke

marke your prime line, and then multiplie the fraction by 240, the pence in one pound, and the numbers that arise by multiplication ouer the prime line are the summe of pence, the value of that fraction giuen, and the remainer on the right hand of the prime line is the fraction of one penny.

Example.

	1.2.3.4.5.
	02457
	240
	90280
4	914
pence. 5	82080

82080:100000 of a *d.*

Here by multiplication of 2457 fifthes by 240 pence, I find 5 pence is gone ouer the prime line, and there remaines 82080:100000 parts of one penny. Now to know the value of that fraction in farthings, multiply the same by 4, and so many as goe ouer the prime line, are farthings, the rest is the fraction of a farthing.

Example.

Example.

	8	2080
9.		4
3	28	320

Numeration in Decimals.

If you haue a number to be expreſſed in Decimals of money, or Coyne ſterling, learne firſt by the Decimall Table how to expreſſe your Coyne, from one penny vnto one pound ſterling, or from one farthing to one pound ſterling, for which the Table going before was calculated. If you would know the manner how to calculate the ſaid Table; diuide 1 pound, adding 7 cyphers vnto it, by your part you would know how to ſet forth in Decimals: as if you would know how a farthing will ſtand in Decimals; diuide 1 pound with cyphers by 960, the number of farthings in one pound ſterling, and the quotient will be the numbers in Decimals, ſignifying one farthing.

Example.

Example.

```
        6
    41644    ....7
10000000 (10416
  9696660
   9999
```

So that I find, that diuiding of 1 pound by 960 farthings, the Quotient is 1 third, 0 fourth, 4 fifths, 1 sixth, and 6 seuenths: for if you should haue proceeded, adding more Cyphers, the Quotient would haue been alwaies 6, because I see the number remaining to be the same it was at the last, that is 64. And although a farthing cannot bee set out exact in Decimals, yet it will serue in Multiplication and Diuision: for in 10000 yards or ells, it wil not differ 1 penny, as shal appeare afterwards by examples in their places.

How to set out a penny in Decimalls.

Diuide 1 penny with Cyphers by 240, the number of pence in one pound sterling, and the quotiēt wil be a penny in decimals.

2. *Exam-*

2. Example.

```
   11
   466        3.4.5.6 7.
10000000(41666
 2444   0
   22
```

Here ſeeing that after I find the firſt quotient 6, and the remainer 16, as before I ceaſe Diuiſion, as needleſſe any further, knowing it will produce 6 in the quotient infinitely, and therfore I put as many times 6 in the quotient, as I find expedient and needfull, and 1 penny ſtands thus:

3.4.5.6.7.
41666

And theſe and diuers other numbers will not be ſet exact in Decimals, but yet they will ſerue to great purpoſe and exactnes in a multitude of queſtions, in ſauing an infinite labour in Reduction, and Multiplication and Diuiſion.

How

How to breake a pound into his exact parts.

Set downe 1 pound thus, 10; then take the tenth, which is one prime, or 2 ſhillings, which I note thus, 1

1

Then take halfe of that prime or 2 ſhillings, ſaying the one halfe of 10 is 5, or the one halfe of one prime is 5 ſeconds, or one ſhilling; then the one halfe of 5 ſeconds is 2 ſeconds, and 5 thirds, ſaying, the one halfe of 5 ſeconds, is 2 ſeconds, and 5 thirds, which is 6 pence: then halfe of 2 ſeconds, 5 ſeconds, is 1 ſecond, 2 thirds, 5 fourths, which doth repreſent 3 pence in Decimals. Againe, one halfe of 1 ſecond, 2 thirds, 5 fourths, is 6 thirds, 2 fourths, 5 fifths, repreſenting 1 penny, half-penny, or three halfe pence. Againe, halfe of that number is 3125, or 3 thirds, 1 fourth, 2 fifths, 5 ſixths; ſignifying three farthings in Decimalls; behold the worke.

Example.

	2 s.	1 l.	6 d.	3 d.
l.	l	2 50	2.3 25	2.3.4
10	10	5 25	25 125	125
1	5			

	1 d. ob.		or 3 *farthings.*
125	3.4.1	625	3.4.5.6
625	625	3125	3125

It is alſo very neceſſary to vnderſtand the proportionall parts of a pound, for by them are many queſtions ſpeedily wrought in Decimals, as ſhall appeare in the examples of Multiplication and Diuiſion afterwards.

How to expreſſe the value of any number in Decimals.

Admit for example this number following, is to bee expreſſed according to the computation of Decimall Arithmatick, *viz.* 3785|725 thirds: then for the expreſsing the ſignification of that number in the knowne parts of Coyne, firſt, marke out your

your prime line, to distinguish the whole numbers from the fractions with a right downe stroke with the penne, and then you shall find the numbers to stand thus 3785 pound, 7 primes, 2 seconds, and 5 thirds; which search in your Decimall Table, and it doth signifie 14 shillings, 6 pence; so that the whole number is 3785 pound, 14 shillings, 6 pence, and so of all numbers: for you shall vnderstand, that euery prime doth signifie in value 2 shillings, euery second 2 pence and 2:5 parts of 1 penny, and euery 5 thirds 1 penny, and 1:5 of 1 penny: or ells euery prime is 1:10 of one pound; euery second 1:100 part of one pound, and euery third 1:1000 part of one pound, &c. infinitely.

How to remoue a Decimall number from one place to another.

If you haue a Decimall number giuen: as for example, 3 pence, which doth thus stand in Decimalls, 1 second, 2 thirds, 5 fourths; then you desire to know how it will stand in the place of primes, pounds, or in the place of 10*l.* or hundreds or thousands.

remoue it one place towards the left hand, and it is 1 prime, 2 ſeconds, 5 thirds, or in knowne parts of coine 2 ſhillings, 6 pence. Againe, remoone them one place more towards the left hand, and it will be 1 pound, 2 primes, 5 ſeconds, or 1 pound, 5 ſhillings. Againe, remoue one place more; and it is 12 pound, 19 ſhillings: Againe, remoue it one place more, and all your fractions are in whole numbers, and will ſignifie 125 pound, &c.

2 s. 6 d. *1 l. 5 s.* *12 l. 10 s.*

4

1 2 5 0 | 1 2 5 0 0 | 1 2 5 0 0

l *l.* *l.*

1 2 5 | 0 0 0 0 | 1 2 5 0 | 0 0 0 0

l.

1 2 5 0 0 | 0 0 0 0

And this Rule is very neceſſary to bee well and perfectly vnderſtood, for by it any price be giuen of a vnite in decimals, you may ſpeedily know what 100, or 1000, or 10000 will coſt at that rate, onely by adding of one, two, or more Cyphers.

As

As for example, if one ell coſt 6 ſhillings 3 pence, what will 100 ells coſt at that rate? firſt, ſet out your price in decimals thus, 3 primes, 1 ſecond, 2 thirds, 5 fourths, and adding of two Cyphers, becauſe 100 hath 2 Cyphers, the ſumm will be 3 1|2500: and becauſe your fractions were fourths, cut off 4 figures and Cyphers towards the right hand, or marke your prime line, and you ſhall find, that 100 ells will coſt 31 pound, 5 ſhillings at that rate.

1. *Example.*

l.	*1.2* . .
3 1	2 5 0 0

If the numbers of the price giuen will not be exactly ſet downe in Decimals: as for example, at 7 pence, 3 farthings a yard, what will 100 yards coſt? Set downe your price as neere as may be, by your Decimall Table, which is 3229|6 ſeuenths, adde vnto it two cyphers, makes 322916 00; and becauſe your fractions are ſeuenths, cut off 7 figures, and there will bee 3 pound, 4 ſhillings, 7 pence.

2. Example.

l. | 1. 2. 3. 4. 5. 6 7
3 | 2 9 1 6 0 0

And thus much ſhall ſuffice for Numeration in Decimalls, and I will now proceede vnto the ſecond Rule of Arithmatick, *viz.* Addition in Decimals.

CHAP. II.

Addition in Decimals of Coyne.

IF you haue diuers ſeuerall numbers giuen in Decimalls to bee added together into one ſumme, place them in order euery one right vnder his like denomination, or kind, Integers vnder Integers, Primes vnder Primes, Seconds vnder ſeconds, &c. Then begin your Addition at the right hand at the leaſt Denomination firſt, and adde them all according to the Rule of Addition, as if they

they were all whole numbers, alwaies having a care to marke out your prime line, and the totall of your Addition will shew you the iust value of those whole numbers and fractions.

1. Example.

Intsgers.	*1.2.3.4.5*
3576	72500
2400	03250
7206	51257
3278	63756
16461	90763

Totall is 16461 *l.* 18 *s.* 1 *d.* 3 *q.*

	li.	*s.*	*d.*	*q*
Here the first number is	3576.	14.	6.	0
The second number is	2400.	00.	7.	3
The third number is	7206.	10.	3.	0
The fourth number is	3278.	12.	9.	0
The totall summe is	16461.	18.	1.	3

CHAP. III.

Subtraction in Decimalls.

IF you haue two numbers in Decimals, the one to be subtracted from the other, place them aboue one the other, as in Addition, the greater numbers in the vpper part, and the smaller numbers right vnderneath, and then subtract them as if they were whole numbers, and note downe the remayners each in their proper places, as in this example.

1. *Example.*

	li.	*l.2.3.4.5*
Lent.	78569	78563
Paid.	69587	06250
Reſt.	8982	72313
Proofe.	78569	78563

	li: s.d.
	8982.14 5.½

The

	li.	s.	d.	d.
The Proofe. Lent.	78569.	15.	8	1:2
Payd,	69587.	1.	3	0:0
	8982.	14.	5	1:2

2. *Example.*

	l.	1.2.3 4.5
Lent.	38057	32567
Paid.	29730	96254
Reſt.	.8326	36313
Proofe.	38057	32567

The proofe in Coyne.

	l:	s.	d.
Lent.	38057.	6.	6
Paid.	29730.	19.	3
Reſt.	8326.	7.	3
Proofe.	38057.	6.	6

CHAP.

Chap. IV.

Multiplication in Decimalls.

IF you haue any two numbers giuen to be multiplied in decimals, place your multiplicand vppermoſt, and your multiplier right vnder-neath, as if the ſame were abſolute whole numbers, and no fractions at all; and when your numbers are placed, marke how many fractions your two numbers doth contain, and note that number downe, and multiply according to any of my former inſtructions in the firſt booke; and when the product is gathered, cut off your prime line, iuſt ſo many figures and ciphers, as your multiplicand and multiplier had fractions betweene them, and the worke is ended.

Example.

If you will multiply 7 5 8|3 2 5 thirds, by 385|7 primes, I place firſt my numbers, and then I find my multiplicand to haue 3 fractions, to wit, primes, ſeconds & thirds, and

and I find my multiplier to haue one fraction, onely primes, which makes 4 fractions, and so many figures I cut off from the product.

Example.

```
          1.2.3
       758325
         3857
-------------
      5308275
     3791625
    6066600
   2274975
-------------
   292485|9529
```

2. *Example.*

If you will multiply 34 pound, 5 shillings 3 pence, by 16 pound, 6 shillings, 6 pence, set them in Decimals, 34|2625 fourths, by 16|325 thirds, and multiply them together, and cut from the product 7 figures to the right hand, and the product will be 559 pound, 6 shillings, 8 pence *ob.* almost.

Example.

Example.

```
          1.2.3.4
        342625
         16325
-------------------
       1713125
        685250
     1027875
    2055750
    342625
-------------------
    559|3353125
```

3. *Example.*

If you will multiply 758 Integers by 3 primes, 7 seconds, 5 thirds, which is by 7 shillings, 6 pence; place them as in the last example, and from the product cut off the 3 figures for the 3 fractions, and the totall is 284 pound, 5 shillings, the sum that 758 ells will cost at 7 shillings, 6 pence an ell, &c.

Example.

Example.

```
      758
      375
  ---------
     3790
    5306
   2274
  ---------
   284|250
```

If you will multiply fractions by fractions in decimals; as to multiply 5 primes, 2 seconds, 6 thirds, 3 fourths, by 7 primes, 2 seconds, 5 thirds; set them as before, and cut off 7 figures.

4. *Examples.*

```
   1.2.3.4
    5263
     725
  ---------
   26315
  10526
 36841
  ---------
 |3815675
```

Makes 7 *s.* 7 *d. ob.*

If

If you will multiply in Decimals by 10, or by 100, or by 1000, &c. set downe your numbers, and marke how many fractions there bee in your multiplicand, and then ad so many cyphers as your multiplier hath to the right hand, and cut off your prime line, and the worke is ended, as in this example.

Example.

```
   1.2.3.4.5.6
 7|8 5 6 0 2 5
        · 1 0 0
 ---------------  785 l·12 s.ob.
 785|6 0 2 5 0 0
```

How to change any fraction giuen into Decimalls.

Admit there be a quotient of a diuision, which is 358 pound, 126:255 of one pound, which fraction you would turne into Demalls; adde a cypher to your numerator of your fraction, makes 1260: but because your number will not be euenly diuided by your denominator 255, therefore adde more cyphers, and then diuide the number by 255 makes 49411 fifths in Decimals to be ioyned

ned with the whole numbers 358|49411 fifthes, and are now fit for multiplication and diuision in Decimals.

5. Example.

```
   1034
  240505      1.2.3.4.5
 12600000 (49411
  2555555
   25555
    222
```

Admit there be a fraction to be set out in Decimals thus, it is required to know what 156 yards of cloth will cost at 196:784 of a pound one yard? Adde to 156, 2,3, or more cyphers, and diuide by the denominator 784, makes 25 seconds, by which multiply 156 yards, makes 39 pound.

Example.

6. Example.

```
  156
   25
-------
  780
 312
-------
 39|00
```

```
   00
 3920   1.2
196000(25
 7844
  78
```

7. Example.

For the proofe of this worke, multiply 156 by 196, makes 30576; which diuided by 784, makes 39 pound, as before.

```
  196
  156
-------
 1176
  980
 196
-------
30576
```

```
   00
 7050   l.
30576(39 the proofe.
 7844
  78
```

CHAP.

Chap. V.

Diuiſion in Decimalls.

IF you will diuide any number in Decimals, either whole numbers by fractions, or fractions by whole numbers, or whole numbers and fractions by whole numbers and fractions; ſet them downe according to the Rules in Decimalls in the operations before going. As for example, a certaine Merchant bought as much cloath as coſt him 284 pound, 5 ſhillings, at 7 ſhillings, 6 pence an ell, the queſtion is, how many elles he had for his money? To doe this, or any other the like queſtion; diuide your ſumme of money 284 pound, 5 ſhillings by 7 ſhillings, 6 pence, and the quotient will ſhew you, what number of ells, and parts of an ell, if any bee, were bought for that money.

1. *Example.*

```
      0
     300
    21790   Ells.
  284250 (758
   37555
    377
     3
```

How to Diuide the ſmaller number by the greater.

If you will diuide 34 pound, 6 ſhillings amongſt 36 men: place your numbers, adding, 3, or 4, or 5 cyphers; and then diuide by 36, makes 95271 fifthes; or in Coyne 19 ſhillings, 0 pence, *ob.* for euery mans portion.

2. *Example.*

```
    1232
   19088   1.2.3.4.5
 3430000(95271, or 19s. ob. 1:4
   36660
    333
```

What

What is the quotient of 724 pound? Diuided by 3:4 of a vnit, or 15 ſhillings? Anſwer: diuide 724 by 75 ſeconds, makes 965 1:3; for triall whereof multiply 965 1:3 by 15 ſhillings, or 75 ſeconds, makes 724, as in the Example.

2. Example.

```
  422
 49085          1.2.3
724000(965|333          or 965   1:3
 75555                      75
  777                   ------
                          4825
                         67555
                             2
                        ------
   The proofe.          724|00
```

This laſt queſtion is in effect no other but as the former: for if I ſhall ſay, a merchant buyes Broad Cloth, coſts him 724 pound at 15 ſhillings, or 3:4 of a pound one yard, the queſtion is, what number he had for his money, and by Diuiſion I find he had 965 yards, and one third part of a yard, as is proued in the example; and ſo diuiding 724 by 3:4, the quotient is 965, 1:3

3. *Example.*

If you will diuide the product of the second example in multiplication, which was 559|3353125 seuenths by 16|325 for the proofe of that worke, which ought to bring out the multiplicand 34|2625; or rather if you will diuide 559 pound, 6 shillings, 8 pence, *ob.* almost, by 16 pound, 6 shillings, 6 pence, the quotient will be 34 pound, 5 shillings, 3 pence.

Example.

```
                 1|048
                 4|2201
Diuisor.        69|58086          l.|1.2.3.4
16|325|559|3353125 (34|2625
      |000|0000000
      489|7500005
        65|305552
         3|26966
          |9721
          |  38
```

The 559|3353125 *proofe.*

How

How to find the Prime line in any Diuiſion decimall, or to find the true denomination of of the Quotient.

In any diuiſion decimall, alwaies marke out your prime line in your diuidend with a ſtreight downe line with the pen, then ſet your Decimall fractions in primes, ſeconds, thirds, fourths, &c. beyond the line; alſo do the like in your diuiſor, and then mark how often you may remoue your diuiſor, that the whole numbers of your diuiſor may ſtand vnder the whole numbers of your diuidend, and ſo many figures ſhall your quotiont haue in whole numbers, the reſt are to bee marked with prickes in the quotient for primes, ſeconds thirds, &c.

If you will diuide 938|61375 fifthes by 34 pound 35 ſeconds, then place them with pricks, as in the example following. I find hauing placed my diuiſor vnderneath my diuidend, that I may remoue my diuiſor twice vnder the whole numbers of my diuidend, and therefore I conclude, the firſt two numbers of my quotient wil be whole numbers, which I marke from the reſt of the numbers in the quotient with a line, and

then diuiding according to the former instruction, you shall find the quotient will bee 27 pound, 3 primes, 2 seconds, and 5 thirds.

Example.

```
      27
   11851
  251168          li. 1.2.3      l.  s.  d.
  938|61375 (27|325   or 27,  6,  6
  34|355555
   343333
    3444
     33
```

2. *Example.*

If you would diuide 15554 pound, 2 primes, 5 seconds, or 5 shillings, by 45 pound? Place them as in the Example following, and you shall find, that there will be in the quotient 3 figures in whole numbers, and the rest will be primes and seconds, so that diuiding of 15554 pound, 5 primes by 45 pound, the quotient is 345 pound, 13 shillings.

Example.

2 2				
2 0 2 9	*l.* 1.2	*l.*	*s.*	
2 5 5 5 4 | 2 5 (3 4 5 | 6 5	or 345	13		
4 5 5 5 5 9				
4 4 4 4				

3. *Example.*

If the greateſt number of your Diuiſor be primes, then the figures of your whole numbers in the quotient will be, once greater in value; then the times you can remoue your Diuiſor, as if you would diuide 241 pound, 5 primes, by 7 primes: then whereas you can remoue your diuiſor by two times vnder the whole numbers 241, yet you ſhall haue 3 numbers in the quotient in whole numbers, becauſe your firſt figure of your diuiſor is primes; ſo that in diuiding 241 pound, 5 primes by 7 primes, I find the quotient will be 345 pound, or integers; and ſo many yards, at 14 ſhillings a yard, which is 7 primes, wil 241 pound, 10 ſhillings buy.

Example.

Example.

```
  33     yards or pounds.
 241|5(345
  777
```

4. *Example.*

If you will diuide 16 pound, 875 thirds, which is 16 pound, 17 ſhillings, 6 pence by 375 thirds, which is 7 ſhillings, 6 pence, or which is all one, imagine there is as much cloth of 7 ſhillings, 6 pence a yard, as coſt 16 pound, 17 ſhillings, 6 pence; the queſtion is, how many yards was bought for that money? placing your numbers as in the example following. I find 45 yards is the anſwere to the queſtion.

Example.

```
  1      yards.
 16|875(45
  3755
   37
```

Example.

5. Example.

If you will diuide whole numbers and fractions by whole numbers, place the whole numbers and fractions vppermoſt, and marke out your prime line, and then ſet your diuiſor vnder-neath; and the loweſt figure in valew of your diuiſor, will ſhew you what is the denomination of the firſt figure of your quotient. As if you will diuide 13 pound 95 ſeconds by 45; or which is all one if you ſhall ſay; if 45 pieces of figgs coſt me 16 pound, 19 ſhillings, what did one piece coſt? Diuide 13|95 ſeconds by 45, makes 31 ſeconds, or 6 ſhillings, 2 pence, 2:5 of a penny for the price of one piece. And in this ſort the price of any number of yards, ells, or pounds being giuen in diuiding it by the number of yards, elles, or pounds, the quotient will bee the price of one; and by this Rule you ſaue a labour of Reduction, alwaies diuiding the price by the number giuen, the greater by the leſſer, or the leſſer by the greater.

Example.

Example.

```
    4    1.  2      s.  d.    d.
 23|95(3   2   or 6   2   2|5
   455
    4
```

6. Example.

If 456 ells of cloth cost 575 pound, 7 primes, what will one ell cost? Diuide 575 pound, 7 primes by 456 ells, makes 1 pound 2625 fourths, or in Coyne, 1 pound, 5 shillings, 3 pence for the price of one ell.

```
   1
  2822
 119548   l. 1.2.3.4      l.   s.   d.
 575|7000(1|2625   or 1.   5.   3
 4560666
  45555
   444
```

Reduction

Reduction in Decimals.

If you will reduce 75 pound, 12 ſhillings, 9 pence into Decimals, enter your Decimal Table, and for 12 ſhillings find 6 primes; then looke for 9 pence, and you ſhall find 375 fourths; ſo the totall is 75 pound, 6375 fourths, and are now fit and apt for any Decimall operation.

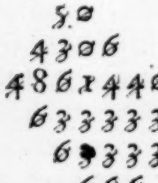
If you multiply or diuide 84 pound, 13 ſhillings, 6 pence, by 17 pound, 3 ſhillings, reduce them into Decimals by the Table, makes for 84 pound, 13 ſhillings, 6 pence 84:675, and for 17 pound, 3 ſhillings, 17:15, and are now fit to be multiplied or diuided one by the other.

If you will reduce 189:756 parts of one pound into Decimals: diuide 189, adding 3 cyphers to it by 756 makes 25 ſeconds for that fraction in Decimalls: and now for example, If 158 ells of cloth & 189:756 parts of an ell coſt 79 pound, 2 ſhillings, 6 pence, what will 640 ells coſt at that rate? Now according to vulgar Arithmatick, either I muſt reduce 158 ells 189:756 parts of an ell into 756 parts, or otherwiſe I muſt

reduce

Reduce the fraction into his leaſt termes, makes 1:4; then I multiply or reduce 158 ells into fourths, makes 633 fourths for the firſt number in the Golden Rule. Secondly, reduce 79 pound, 2 ſhilling, 6 pence into pence, makes 18990 pence for the ſecond number; then put 640 ells into fourths, makes 2560 fourths; then multiply 18990 by 2560, makes 48614400; which diuide by 633, makes 320 pound.

Example.



The ſame example wrought by Decimalls.

If 158 ells 1:4 ell coſt 79 pound, 2 ſhilling, 6 pence, what will 640 ells coſt at that rate? Place them in Decimals thus: If 158|25 ſeconds coſt 79|125 thirds, what 6.;0 ells? Multiply 79|125 thirds by 640, makes 50640|000; which diuide by 15825, makes 320 pound the quotient.

Example

Example.

	1.2.3		
79	125		
	640	*3265*	*l.*
		5064000(320	
3165	000	*2582555*	
47475	0	*25822*	
		258	
50640	000		

Or otherwiſe.

Diuide 15825 by 79125, adding one cypher, makes 2 primes for the Quotient; wherefore I conclude, that one halfe of 640 pound which is 320 pound, is the anſwere to the queſtion demanded. Alſo diuide 79125 by 15825, the quotient is 5 primes; by which multiply 640 pound, makes 320 pound for the anſwere to the queſtion as before.

If a Phillips Dollar be worth 4 ſhillings, 8 pence, what are 465342 Dollars worth in ſterling money? Anſwer, multiply 465342 by 5 primes, which is 4 ſhillings, and take the ſixth part of that product, and adde into it, makes 1085798 primes for the anſwer.

Or

Or otherwiſe, multiply by 2 primes, and 1:3 of a prime, becauſe 8 pence is 1:3 of a prime, and both wayes will produce the ſame anſwere.

Example.

465342		465342	
	2 1:6		2 1:3
93068	4	93068	4
15511	4	15511	4
108579	8	108579	8

If a common Dollar be worth 4 ſhillings, and a Princes Dollar bee worth 4 ſhillings, 6 pence, how many Princes Dollars will pay for 7584 common Dollars? Multiply 7584 by 4 ſhillings, and diuide by 4 ſhillings, 6 pence, makes 6741 Dollars, and 7 ſeconds, and 5 thirds will remaine, which is 18 pence; ſo that I conclude, 6741 Princes Dollars at 4 ſhillings, 6 pence a piece will pay for 7584 common Dollars, and there will remaine 18 pence.

Example.

Example.

```
 7584        169375 Dollars. 2.3
    2       1516800(6741 75
-------       225555
1516|8         2222
                 22
```

In 654 pound, how many Dollars of 3 ſhillings a piece? Adde two Cyphers to 654, makes 65400, becauſe 3 ſhillings hath 2 fractions in Decimals, *viz.* primes and ſeconds, which is 1 prime and 5 ſeconds, by which diuide 65400, makes 4360 Dollars at 3 ſhillings a piece.

Example.

```
   9      1.Dollars:
65400(4360
15555
 111
```

In

In 756 pound how many Dollars of 3 ſhillings, 9 pence a piece? Adde 4 Cyphers to 756, makes 7560000; which diuide by 1875, which is 3 ſhillings, 9 pence in Decimals, makes 4032 Dollars. Behold the example following.

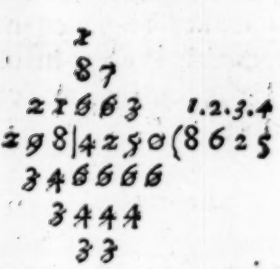
Example.

```
      375   Dollars.
7560000(4032
1875555
 18777
  188
   1
```

If I doe ſell 346 yards of Veluet for 298 pound, 8 ſhillings, 6 pence, how doe I ſell one yard? Anſwere: diuide the price by the quantitie of yards in decimals, makes 8625 fourths, or in Coyne 17 ſhillings, 3 pence for the price of one yard.

Example.

Example.



Makes 17 *s.* 3 *d.* a yard.

A Merchant would buy ſeuerall ſorts of Spices of ſeuerall prices, to wit, of 3 ſhillings a pound of 2 ſhillings, of 1 ſhillings 3 pence, of 1 ſhillings 7 pence, and of 2 ſhillings, 2 pence a pound, and would haue of each a like quantitie; for 324 pound, the queſtion is, how many pound hee muſt haue of each? Firſt, adde all the prices into one ſumme, makes 11 ſhillings. by which diuide 324 pound, makes 584 pound. 1:11 of a pound; and ſo many pound muſt he haue of each ſort.

A Goldſmith ſent his ſeruant to the Tower of London, to fetch him 415 pound, 18 ſhillings, 9 pence in pieces of 6 pence, of 4

pence, of 3 pence, of 2 pence, of 1 penny, and of one halfe penny, and bad him bring of each sort a like quantitie: First, adde all your Coyne, makes 16 pence halfe penny, which in Decimals is 6875 fifths: by which diuide 415|7375 fourths, makes 6050 pieces of each sort.

Example.

24

4 1 5 7 3 7 5 (6 0 5 0 pieces of each sort

6 8 7 5

6 8 7 7

6 8 8

6

Rules of Practice in Decimalls.

Set your price giuen in the Decimall Table of a vnite, be it yard, ell, piece, or pound, and by the price giuen, multiply the number of yards, ells, pieces, or pounds, and the product will bee the summe that you seeke, if you doe but marke out the prime line, as shall appeare by examples following.

1. *Example.*

1. *Example.*

If one pound weight of ſmall Ginger coſt 7 pence half-penny, what will 112 pound waight coſt? Find for 7 pence half-penny 3125 fifths, which multiply by 112 pound, makes 350000, from which cut off fiue figures to the right hand by the prime line, and the ſumme is 3 pound, 5 primes, or 3 pound, 10 ſhillings, becauſe your multiplicand hath 5 fractions.

Example.

2.3.4.5	
3125	
112	*l.2 3.4*
6250	171|2500
3125	makes 171*l.*5*s.*
3|1125	
3|50000	

How to find the price of any vnite in any place of 10, or 100, or 1000, the price of one being giuen.

If the price of a vnite bee giuen at any rate, and from thence you desire to know, what 10, or 100, or 1000, or 10000 will cost at that rate: or otherwise, if you desire to know, if you doe gaine any rate desired by the pound, and would know at what rate it will be in the 100 pound, or vpon exchange from place to place, the exchange of one pound being giuen, you desire to know, what 100 pound will amount vnto? Place your rate or gaines giuen in Decimalls by helpe of the Table, and then adding of one, two, three, or more Cyphers, cutting off your prime line, you shal know your desire, marking the denominations of your fractions, if the least to the left hand be primes, seconds, thirds, fourths, fifthes, cutting off your prime line so many figures from the right hand.

Example. Make

2. *Example.*

If one pound ſterling be 1 pound, 14 ſhillings, 3 pence Flemiſh, what is 100 pound ſterling worth? Place 1 pound, 14 ſhillings, 3 pence in decimals, makes 1|7125 fourths: then becauſe 100 pound hath 2 Cyphers, makes 171 2500: then cutting off 4 figures to the right hand, you ſhall find 171 pound, 5 ſhillings for 100 pound ſterling, to make as appeareth before.

If one ell of Cambrick coſt 7 ſhillings, 6 pence, 3 farthings, what will 100 ells coſt at that rate? Place 7 ſhillings, 6 pence, 3 farthings in Decimals, makes 378125 ſixths, and adding two Cyphers for 100, makes 37812500: from which cut off 6 figures to the right hand, makes 37 pound, 16 ſhillings 3 pence for the ſumme that 100 elles will coſt.

3. *Example.*

1.2.3.4.5.6

37|812500

Makes 37*l.* 16*s.* 3*d.*

4. *Example.*

1112|5000

If one pound or piece coſt 1 pound, 2 ſhillings, 3 pence, what will 1000 pieces coſt? Set 1 *d.* 2 *s* three pence, in Decimalls makes 1|1125 fourths: to the which adde 3 Cyphers, becauſe 1000 hath 3 Cyphers, and from the totall cut off 4 figures, makes 1112 pound, 10 ſhillings, as is in the 4 example aboue

If one ell of Holland coſt 3 ſhillings, 3 pence, what will 343 ells coſt? Multiply 343 by 3 ſhillings, 3 pence in Decimalls, which is 1625 fourths, makes 55 pound, 14 ſhillings, 9 pence.

5. Example.		*6. Example.*	
1. 2 3 4		*1. 2. 3*	
1625		972	
343		775	
4575		4	8860
6	500	68	04
48	75	680	4
55	7375	753	300

If one yard of Velvet coſt 15 ſhillings, 6 pence, what will 972 yards coſt? Find for 15 ſhil-

15 ſhillings 75 ſeconds; then for 6 pence find 25 thirds, total is 775 thirds; by which multiply 972, makes 753 pound, 6 ſhillings, as aboue in the ſixth Example.

If one yard of Veluet coſt 17 *s.* 7 *d.* 3 *q.* what will 857 yards coſt? Firſt, find 17 *s.* to be 85 ſeconds; then 7 *d.* 3 *q.* makes 322916, totall is 8822916; which multiply by 857, makes 756 *l.* 2 *s.* 5 *d.* 3 *q.*

7. Example.

1.2.3.4.5.6.7	
8822916	
857	
6	1760412
44	114580
705	83328
756	1239012

8. Example.

1.2.3.4	
2375	
758	
1	9000
11	875
166	25
180	0250

If one Dollar be worth 4 ſhillings, 9 pence what are 758 Dollars worth in ſterling money? Multiply 4 ſhillings, 9 pence, which is 2375 fourths by 758, makes 180 pound, 6 pence, as in the eighth example aboue.

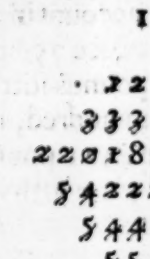
The price of any number of yards, ells, pieces, or pounds giuen to find the price of a vnite.

If the price of any number of yards, ells, pieces, or pounds be giuen, set them downe in Decimals, adding one, two, or more Cyphers, if neede require, and diuide that sum, or price by the number of the yards, elles, pounds, or pieces, and the quotient is the price of a vnite in whole numbers, primes, seconds, and thirds, without reduction, as shall appeare by examples following: and in this manner you may know what summe of money was lent, if the principall and interest be giuen at any rate in the hundred; or you may know if the rate of one pound exchange be giuen for any place, you may know the value of 100 of that Coyne in that money giuen; and by this Rule is to bee abreuiated almost al operations of Arithmatick, by finding the value of a vnite in any place desired.

If 542 ells of cloth cost 22 pound 4 pence half-penny, what cost one ell at that rate? Diuide 22|01875 fifthes by 542, makes 40625 sixths, or in Coyne 9 pence 3 farthings

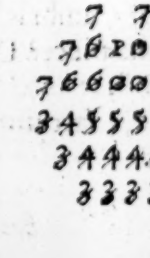
things for the price one ell coſt.

1. *Example.*



If 345 pound gaine 76 pound, 12 ſhillings, what doth one pound gaine? Diuide 76600000 by 345 pound, makes 222028 ſixth, or in Coine, makes 4 ſhillings, 5 pence half-penny almoſt, that 1 pound doth gaine as in the example following.

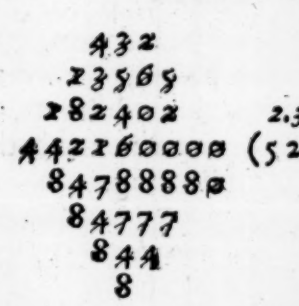
2. *Example.*



If

If 756 pound, 3 quarters, 24 pound of ſugar coſt 4421 pound 12 ſhillings, what did one pound waight coſt, accounting 112 pound to the hundred? Reduce 756 pound 3 quarters, 24 pound into pounds ſuttle, accounting 112 pound to the hundred, makes 84780 pound; then diuide 4421 pound, 12 ſhillings by 84780, makes 5215 fifths, or 12 pence, half-penny one pound.

3. *Example.*



If I ſell 1000 pieces of Cambricke for 700 pound, how doe I ſell one piece? Diuide 1000 by 700, makes 1 pound, 42857 fifthes, 1 pound, 8 ſhillings, 6 pence, 3 farthings, as in the Example following.

Example.

4. Example.

3 2 6 4 8 *l.* 1.2.3.4.5
2 0 0 0 0 0 0 0 0 0 (1|4 2 8 5 7
7 7 7 7 7 0 0

If one pound ſtarling be 1 pound, 14 ſhillings, 3 pence Flemiſh, what is one pound Flemiſh worth: Diuide one pound with Cyphers by 17125, makes 11 ſhillings, 8 pence, 1 farthing almoſt.

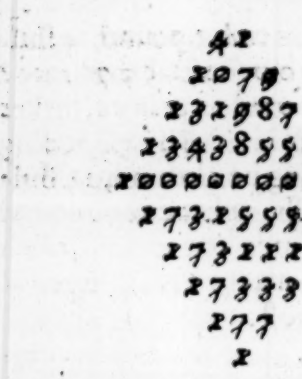
5. Example.

2
6 6 2
2 4 3 7 8 2 5 *l.* 1.2.3.4
2 0 0 0 0 0 0 0 0 (5 8 3 9
2 7 2 2 5 5 5
2 7 2 2 2 2
2 7 2 2
2 7

If 1 *l.* ſterling be 1 *l.* 14 *s.* 7 *d. ob.* Flemiſh, what is 100 *l.* Flemiſh worth in ſterling money? Diuide 100 by 1|73125 fifths, which is 1 *l.* 14 *s.* 7 *d. ob.* in Decimals, makes 57 *l.* 15 *s.* 3 *d.*

6. Example.

6. Example.



The Golden Rule in Decimalls.

If the number giuen be pounds, ſhillings and pence, ſet them out in Decimals, and alſo your number of yards, ells, pieces, pounds or any other numbers, ſet them out alſo in Decimals, and then without reduction, multiply the third number by the ſecond, and diuide by the firſt, according to the inſtructions of multiplication and Diuiſion in the former part of this booke, and the quotient will be the third number ſought.

1. Example.

1. *Example.*

If 34 ells of Canuas coſt 1 pound, 4 ſhillings, what will 756 ells coſt at that rate? Multiply 756 by 1 pound, 2 primes, makes 907|2 primes; which diuided by 34, adding Ciphers, makes 26|6823 fourth, or in Coine 26 pound, 13 ſhillings, 8 pence.

Example.

```
  756
   12
-----
 1512
 756
-----
 9072
```

```
   2 . 2          l.1.2.3.4
223882 (26|6823
9072000
3444444
 33333
```

If 112 pound of Indico coſt 34 pound, 17 ſhillings, what coſt 789 pound, ſubtill accounting 100 pound to the hundred? Multiply 34|85 ſeconds by 789, makes 27496 pound, 65 ſeconds; which diuided by 112 pound, makes 245 pound, 5058 fourths, or 10 ſhillings, 1 penny farthing.

Example.

Example.

```
      1.2
    3485
     789
-----------
   31365
  27880
 24395
-----------
 37496|65
```

```
   65 |
  5016|69          l.1234
 77496|6500(245|5058
 11222|2222
  1111|111
   111|11
```

If 981 ells of Cloath cost 94 pound, 13 shillings, 6 pence, what cost 2943 ells at that rate? Diuide the third number by the first, and by the quotient multiply the second, and the product will be the answere sought.

```
2943(3
 981
```

```
      1.2.3
   94|675
     |   3
-----------
  284|025
```

Makes 284 *l.* 6 *d.*

If

If 112 pound of Sugar coſt 5 pound, 3 ſhillings, 9 pence, how many pounds will 124 pound buy at that rate? Diuide 5|1875 fourths by 112 pound, to find the price of 1 pound, makes 46316, ſixths, or in Coyne 11 *d.* 1: 10 of a penny almoſt for the price that one pound coſt Secondly, diuide 124 pound by the price of one pound, *viz.* by by 46316 ſixths, makes 2677|3 primes, and ſo many pound he ſhall haue for 124 pound.

If one yard Broad Cloath coſt 16 ſhillings, 9 pence, how many yards ſhall 56 pound buy at that rate? Diuide 56 pound by 16 ſhillings, 9 pence, the price of one yard, makes 66 yards, 9:10 almoſt.

Example.

```
    5
    250
  575000  yards.  yard.
56000000(66  86:100
 8375555
  83777
   833
    8
```

If

If 7 yards 1:2 of cloth coſt 9 ſhillings, what will 8 yards 1:3 of a yard coſt? Multiply 9 ſhillings, or 45 ſeconds by 8 1:3, makes 375; which diuide by 7 yards 1:2, or by 7|5 primes, makes 5 primes, or 10 ſhillings.

Example.

1
4|5
8, 1:3

360
15

375

1 3
375 (5, or 10
75

If 5 yards 1:2 coſt 4 ſhillings, 8 pence, 1:4 of a penny, or 56, 1:4, what will 30 yardes coſt at that rate? ſet your 56 pence 1:4 in Decimals, makes 56|25 ſeconds, which multiply by 30, makes 1687|50 ſeconds; which diuided by 5 yards on halfe, or 5|5 primes, makes 306 pence 8:10 of one penny for the price of 30 yards, as in the example following.

Example.

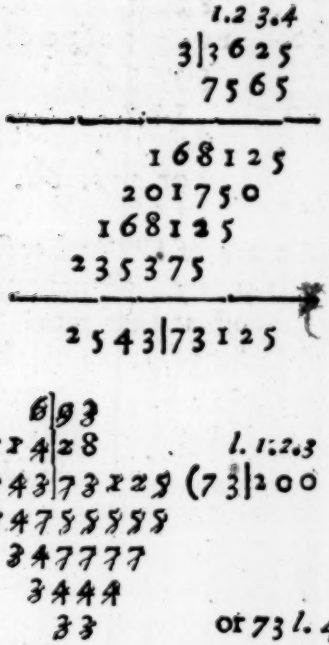
Example.

```
 56|25        134|1        d. 1.
     30      1687|50(306. 8.
-------       55555
1687|50        555
```

or 25 *s.* 6 *d.* 4:5 of a *d.*

If 34 ells 3:4 of Holland coſt 3 pound, 6 ſhillings, 1 penny, half penny, what will 956 ells 1:2 coſt at that rate? Multiply 3 pound, 6 ſhillings, 1 penny, half penny, which is 3|3625 fourths by 756|5 primes, makes 2543|73125; which diuided by 34 ells, 3:4, or by 34|75, makes 73|200 thirds or 73 pound, 4 ſhillings.

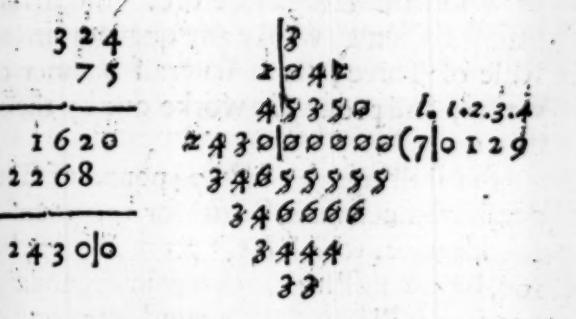
Example.



If 346 pound, 10 ſhillings gaine 32 pound 8 ſhillings, what will 75 pound gaine at that rate? Firſt, multiply 32|4 primes by 75 makes 2430|0 prime; which diuided by 346|5 primes, makes 7|0129 fourths, or 7 pound, 3 pence for the anſwere.

Example.

Example.



The ſame Queſtion wrought a ſecond way.

Diuide 32|4 primes, by 346|5 primes, adding 5 cyphers, and the quotient wil be 935 fourths; which multiply by 75, makes 7 *l.* 0125 fourths, which doth not want one farthing of the former ſumme.

The ſame Queſtion wrought another way.

Diuide 75 pound, adding 5 Cyphers by 346 pound, 5 primes, and the quotient will bee 21645 fifths; which multiply by 32|4 primes, makes 7012980; from which abate

6 figures to the right hand, becauſe of your 6 frractions and the remainer wil be 7 pound 0129 fourths, &c. as before. And in this manner you may worke any queſtion in the Rule of Three, three ſeuerall manner of wayes, and proue the worke one by the other.

If 12 ſhillings doe buy 74 pound of Ginger, how much ſhall I haue for 100 pound? Diuide 7400, which is the product of 74 by 100, by 12 ſhillings, or 6 primes, and the quotient will be 12333 pound, 1:3, and ſo much Ginger ſhall I haue for 100 pound at that rate. Or otherwiſe, diuide 100 pound by 6 primes, makes 166 2:3, which multiply by 74, makes 12333 pound, 1:3, as before.

Briefe Rules how to abreuiate your worke in the Golden Rule, by marking the proportions betweene the numbers giuen.

When as any queſtion is propounded in the Golden Rule, marke what proportion is betweene the firſt and ſecond numbers, or betweene the firſt and third numbers, or betweene the third and ſecond; for if you eſpie

eſpie them in any proportion, the queſtion demanded is very ſpeedily anſwered, vpon the firſt ſight; or yet if you ſee them not exactly to be euen proportionals, yet you may ſubtract the firſt from the third, once twice or three times, or more and ſo often take the middle number towards the anſwer to the queſtion, and then you neede not to multiply by your whole third number, as you ſhall ſee by examples following.

1. *Example.*

If 34 ells coſt 2 pound, 4 ſhillings, 1 penny, what will 340 elles coſt? Heere comparing the firſt & third numbers, one with another, I find the third doth containe the firſt 10 times, wherefore I multiply 2 pound 4 ſhillings, 1 penny by 10, and the totall is 22 pound, 10 pence, the Anſwere.

2. *Example.*

If 82 ells of Cloth coſt 4 pound, 2 ſhillings, what will 324 ells coſt at that rate? Here I find 4 pound, 2 ſhilling in Decimals to be one halfe of 82, but it ſtandeth one roome leſſe in value then 82 doth, ſo I con-

clude, that halfe of 324 one roome leſſe is 16 pound, 2 primes, or 4 ſhillings, the Anſwere.

3. *Example.*

If 345 ells of Holland coſt 34 pound, 10 ſhillings, what will 789 ells coſt at that rate? Set downe 34 pound, 10 ſhillings in Decimalls, makes 34 pound, 5 primes, which is the firſt number placed but one roome lower; therefore I ſay, if 345 ells coſt 34 pound, 5 primes one roome more to the right hand, then the third number alſo will coſt 78 pound, 9 primes one roome more to the right hand, which is 78 pound, 18 ſhillings.

4. *Example.*

If 12 ells of Cloath coſt 2 ſhillings, foure pence, 4:5 of one penny, what will 356 ells coſt? place 2 ſhillings, 4 pence, 4:5 in Decimals, makes 1 prime, 2 ſeconds, or 12 ſeconds, which is the ſame number: but it ſtands two roomes lower; therefore I conclude, that 356 ells coſt the ſame numbers two rooms lower, which is 3 pound, 11 ſhillings

lings, 2 pence, 2:5 of one penny.

If 12 ells coſt 12	*l.* 2	*l.*	*l.* 2
ſeconds, what will	3 5 6 | 0 0	or 3.	5 6
	3 5 6		

5. Example.

If 130 ells of cloth coſt 26 pound, what will 3759 ells coſt at that rate? I find the ſecond number to bee twice the firſt, but it ſtands one place nearer the right hand; therfore I conclude, that the third number will coſt twice aſmuch in his lower roome, which is 751 pound, 16 ſhillings.

If 130 coſt 26 pound, what coſt 3759.

	3759 |	*l.* 1
130	375 | 9	751 | 8
26	| 2	
	751 | 8	

6. Example.

If 75 ells one halfe coſt 7 pound, 11 ſhillings, what will 328 \| 12 ſeconds coſt? Set them downe in Decimalis, and you ſhall find

them to ſtand thus, 75|5 primes for the firſt numbe1, and 755 ſeconds for the ſecond number, which is the ſame one roome nearer the right hand: ſo I conclude, that the third number wil coſt 32|85 ſeconds, which is 32 pound 17 ſhillings.

Example.

Ell.	*l.*	*s.*	*d.*
75|5	328|5	0	
7|55	32|8	5	

The anſwer. 32 *l.* 17 *s.*

1. *Example.*

If 356 ells of Canuas coſt 38 pound, 12 ſhillings, 1 penny, what will 740 ells coſt at that rate? Firſt, diuide 740 by 356, the quotient will be 2 and therefore I take twice the price giuen for that quotient, and then whereas before I ſhould haue multiplied 38 pound, 12 ſhillings, 1 penny by 740, I ſhall neede to multiply it but by 28 the remaynor, and diuide it by 356, makes 3|0368 fourths, to bee added to the former ſumme, and the totall will be as in the example following.

Example.

Example.

	l.	s.	d.			d.
	38.	12.	1	38	6.	1
28	2			2	8	
740(2						
356	77.	4.	2	308	8	
	3.	0.	8 ¾	772	1166	
	80.	4.	10¾ d	1080	9166	

300
124300 l. 1.2.3.4 l. d.
1080|91666 (3|0368. or 3. 9 almost.
3566666
35555
333

Here in this last example, I multiply 38 pound, 6 primes by 28, omitting the penny, not setting it out in decimals, and the product is 1080|9 primes: then multiply 1 penny by 28, makes 28 pence, which is one prime, 166 fourths, and the totall was 1080 pound, 9116 fourths, as in the example; and in this manner you may saue a great labour

labour in multiplying your number of pounds and ſhillings firſt, and then multiply your pence by themſelues, and adde into the reſt in primes, ſeconds, &c.

2. Example.

If 17 ells of Holland Cloth coſt 3 pound 2 ſhillings, 5 pence, what will 515 ells coſt at that rate? Diuide 515 by 17, makes 30, by which multiply 3 pound, 2 ſhillings, 5 pence, makes 93 pound, 12 ſhillings, 6 pence, then the remayner of your diuiſion will be 5 ells, by which 5 multiply 3 pound, 2 ſhillings, 5 pence, makes 15 *l.* 10 ſhillings, 1 penny, or in Decimals 15|50416 fifthes; which diuided by 17, makes 912 thirds, or 18 ſhillings, 3 pence almoſt; which added to 93 pound, 12 ſhillings, 6 pence, makes the anſwere to bee 94 pound, 10 ſhillings, 9 pence: and ſo here in ſtead of multiplying 3|120833 ſixths by 515, and diuiding by 17 I haue ſaued more then halfe the worke.

Example.

Example.

```
  5          l.  s.  d.
515(30.    3.  2.  5          3.  2.  5
17         30.                 5
 17        ----------         ----------
           93. 12. 6          15. 10. 1
               18. 3
           ----------
           94. 10. 9

        |23          1.2.3.4.5
     15|50416(91200
       177777
        1111
```

3. *Example.*

If 7 pound buy 100 pound waight of Sugar, how many pound waight will 156 buy me at that rate? Diuide 156 by 7, makes 22, 2:7; by which multiply 100, makes 2228 pound, 4:7

---

4. *Example.*

4. Example.

If 356 pieces of Callicoes coſt 300 pound, 15 ſhillings, how much will 917 pieces coſt at that rate? Diuide 917 by 356, makes in the quotient 2; therefore take the price giuen twice, and there will remaine after your diuiſion 205; by which multiply 300|75 ſeconds, makes 61653|75 ſeconds; which diuided by 356, makes 173 pound, 18 ſeconds, or 173 pound, 3 ſhillings 8 pence, to bee added to the former ſumme 601 pound, 10 ſhillings, makes 774 pound 13 ſhillings, 8 pence, for the Queſtion.

The ſame queſtion wrought without Reduction in Decimals.

If 356 coſt 300|75 ſeconds, what 917? Multiply 300|75 ſecond by 917, makes 275787|75 ſeconds; which diuide by 356, makes 774|68 ſeconds, or 774 pound, 13 ſhillings, 8 pence, as before the proofe.

Example.

Example.

300	75	23	
9	17	2640	
		265631	*l.1.2*
2105	25	2757875(7746	8
3007	5	3966666	
270675		35553	
		333	
2757875			

5. Example.

If 179 pound of Indico coſt 60 pound 13 ſhillings, 5 pence, what will 716 pound coſt at the ſame rate? diuide 716 by 179, makes 4 in the quotient, and nothing wil remaine: wherefore I conclude, that 4 times 60*l.* 13 *s.* 5 *d.* which is 242 *l.* 13 *s.* 8 *d.* and is the anſwere to the queſtion demanded.

6. Example.

If 36 pound of Cloues coſt 11 pound, 6 ſhillings, how many pound ſhall I haue for 354 *l.* Diuide 11|3 primes by 36, makes 31388 fifths; which multiply by 354, cutting of

of figures for the 5 fractions, makes 111 pound, 11352 fifthes, or 3 pound, 2 shillings 2 pence, 3 farthings for the answere.

Fellowship in Decimals.

To worke the Rule of Fellowship in Decimals, gather the whole number of all the moneys disbursed into one summe, and then diuide the money gained or lost by that summe, and multiply that quotient so found by each seuerall partners stocke disbursed, and the products will be each seuerall mans gaine or losse.

1. *Example.*

Foure Merchants made a company: *A.* put in 60 pound, *B.* 80 pound, *C.* 120 pound, *D.* 140 pound, and they gained 72 pound; the Question is, what part each Merchant must haue of the gaines? First the totall summe of all their moneys disbursed was 400 pound, wherefore according to the rule I diuide 72 pound, adding Cyphers vnto it by 400, and the quotient is 1 prime, 8 seconds; by which I multiply each seuerall mans Stock disbursed, and I find, *A.* shall haue

haue 10 pound, 16 ſhillings; *B.* 14 pound 8 ſhillings; *C.* 21 pound 12 ſhillings, and *D.* 25 pound, 4 ſhillings; totall is 72 pound, as in the example.

Example.

60	80	120	140
18	18	18	18
480	640	960	1120
60	80	120	140
10|80	14|40	21|60	25|20

3 1.2	*l.1.2*
7200(18	10|80
4400	14|40
	21|60
	25|20
	72|00

2. *Example.*

Foure Merchants made a company, and ſet forth a ſhip to ſea, which coſt them 3616 pound, 13 ſhillings; *A.* muſt pay 1:3 of the money; *B.* 1:4, *C.* 1:5, *D.* 1:6, the queſtion

ſtion is, what each man muſt pay of the ſaid ſumme? Take a a number wherein the like parts may be had, which in the former book of vulgar Arithmatick, I find to bee 60, whereof 1:3 is 20 and 1:4 is 15, and 1:5 is 12 and 1:6 is 10, the totall is but 57: wherefore I deuide 3616|65 by 57, and the quotient is 63|45 ſeconds; which I multiply by 20, and I find *A* ſhall pay 1269 pound; then I multiply by 15, and *B*. ſhall pay 951|75 ſecond; and by 12, and *C*. ſhall pay 761|4 primes; and by 10, and *D*. ſhall pay 634|5 primes, the totall is 3616|65 ſeconds, the proofe of the worke.

Example.

l. 1.2	*L.* 1.2	*l.* 1.2	*l.* 1.2
63|45	63|45	63|45	63|45
20	15	12	10
1269|00	951|75	761|40	634|50

3. *Example.*

Three Merchants made a Company: *A*. put in 56|6 primes; *B* put in 39|8 primes; *C*. put in 120|4 primes, and they gained 58 pound,

pound, 16 ſhillings, or 58 pound, 8 primes, what muſt each man haue of the gaines; firſt, the totall disburſed is 216 pound, 4 primes; by the which I diuide 58 pound, 8 primes, & the quotient is 27197 fifthes for one pound gaines; which I multiply by each ſeuerall mans money disburſed, and I find *A.* ſhall haue 15 pound, 7 ſhillings, 10 pence half penny; *B.* 10 pound, 14 ſhillings, 3 pence, 3 farthings; *C.* ſhall haue 32 pound, 13 ſhillings, 9 pence, 3 farthings, the totall is 58 pound, 16 ſhillings, the proofe.

Example.

	l.	*1.2.3.4.5.6*	*l.*	*s.*	*d.*	*q*
A.	15	393502	15	7	10	2
B.	10	715618	10	14	3	3
C.	32	690794	32	13	9	3
tot.	58	799914	58	16	00	0

4. *Example.*

Three Captaines agree together to deuide a ſpoyle or bootie, which they had taken, containing 7851 *li*: in this ſort, *A.* is to haue 1:2; *B.* 1:3; *C.* 1:4; the queſtion is,

what each mans ſhare ſhall be? Find a number which hath ſuch parts in it, *viz.* 12, whereof 1:2 is 6, 1:3 is 4, and 1:4 is 3, which in one ſumme makes 13; therefore diuide 7851, adding cyphers to it by 13, and the quotient will be 603 pound, 92307 fifthes; which multiply by 6, 4, and 3, and you ſhall find, *A.* ſhall haue 3623 pound, 53842 fifths; *B.* ſhall haue 2415 pound, 69228 fifths; *C.* ſhall haue 1811 pound, 76921 fifths; the Totall is 7850 pound, 99991 fifths, which doth want but 1 fourth of 785·1 pound, which in value is but 3:125 parts of 1 penny, and this example is to bee wrought without the Golden Rule. Behold the proofe of the worke.

Example.

	l.	1.2.3.4.5		*l.*	*s.*	*d.*	*q*
A.	3623	53842		3623.	10.	9.	1
B.	2415	69228		2415.	13.	10.	1
C.	1811	76921		1811.	15.	4.	1
	7850	99991		7851.	00.	00.	0

Example.

The same example wrought another way.

After you haue diuided 7851 pound by 13, find in your Decimall Table what the quotient is in Coyne, makes 603 pound, 18 shillings, 5 pence, *ob.* which multiply by 6 4, and 3, and their totall in one summe is the answere, as before.

	l.	*1*	*d.*			*l*	*1.*	*d.*
603	9.	5.	*ob.*	603	9.	5.	*ob.*
	6				4		
3623	5.	9.	00	2415	65.	10.	0

	l.	*1*	*d.*
603	9.	5.	*ob.*
	3		
1811	75.	4.	*ob.*

These three seuerall products added into one sum, makes 7850 *l.* 19 *s.* 11 *d.* wanting but one penny in the whole sum, which is the defect of the Decimals, which cannot be exactly set out in coyne, but it wil serue to answere a question of one million with one penny errour at the most.

what each mans ſhare ſhall be? Find a number which hath ſuch parts in it, *viz.* 12, whereof 1:2 is 6, 1:3 is 4, and 1:4 is 3, which in one ſumme makes 13; therefore diuide 7851, adding cyphers to it by 13, and the quotient will be 603 pound, 92307 fifthes; which multiply by 6, 4, and 3, and you ſhall find, *A.* ſhall haue 3623 pound, 53842 fifths; *B.* ſhall haue 2415 pound, 69228 fifths; *C.* ſhall haue 1811 pound, 76921 fifths; the Totall is 7850 pound, 99991 fifths, which doth want but 1 fourth of 7851 pound, which in value is but 3:125 parts of 1 penny, and this example is to bee wrought without the Golden Rule. Behold the proofe of the worke.

Example.

	l.	1.2.3.4.5	*l.*	*s.*	*d.*	*q*
A.	3623	53842	3623.	10.	9.	1
B.	2415	69228	2415.	13.	10.	1
C.	1811	76921	1811.	15.	4.	1
	7850	99991	7851.	00.	00.	0

Example.

The same example wrought another way.

After you haue diuided 7851 pound by 13, find in your Decimall Table what the quotient is in Coyne, makes 603 pound, 18 shillings, 5 pence, *ob.* which multiply by 6 4, and 3, and their totall in one summe is the answere, as before.

	l.	*1*	*d.*			*l*	*1.*	*d.*
603	9.	5.	*ob.*	603	9.	5.	*ob.*
	6				4		
3623	5.	9.	00	2415	65.	10.	0

	l.	*1*	*d.*
603	9.	5.	*ob.*
	3		
1811	75.	4.	*ob.*

These three seuerall products added into one sum, makes 7850 *l.* 19 *s.* 11 *d.* wanting but one penny in the whole sum, which is the defect of the Decimals, which cannot be exactly set out in coyne, but it wil serue to answere a question of one million with one penny errour at the most.

5. *Example.*

Three men made a ſtocke together, and they gained 244 pound, 8 ſhillings: *A.* put in 315 pound 7 moneths, *B.* 408 pound 10 moneths, *C.* 500 pound 3 moneths; now the queſtion is, what each man muſt haue of the gaines? Firſt, multiply each mans ſtocke by his time, and gather all the totals into one ſumme, and they make 7785; by which diuide your gaines, 244 pound, 4 primes, and the quotient will bee 31393 ſixths; which multiply by the ſeuerall products of each mans money and time, and the totall of each ſeuerall product is the ſumme deſired for each mans part of the gaine.

Example.

A.	69	22836	69	4	6	3
B.	47	08800	47	1	9	1
C.	128	08210	128	1	8	0
	244	40046	244	8	0	0

Poſition

Position in Decimals.

The Merchants bought a parcell of Linnen Cloth coſt them 757 pound, 17 ſhillings whereof *A.* muſt pay 1:4; *B.* 1:5; *C.* 1:8; what muſt each man pay of this ſum? I take 20 for a number, wherein I can haue thoſe parts, *viz.* 1:4 of 20 is 5, and 1:5 of 20 is 4, and 1:8 of 20 is 2 pound 5 primes, or 2 one halfe, their totall is 11 pound, 5 primes, or 11 1:2; by which I diuide 757 pound, 85 ſeconds, and the quotient is 65 *l.* 9 primes, which I multiply by 5 for *A.* makes 329 pound, 10 ſhillings; *B.* 263 pound, 12 ſhillings; *C.* 164 pound, 15 ſhillings: the totall is 757 pound, 85 ſeconds.

1. *Example.*

A.	B.	C.	
l. 1	*l.* 1	*l.* 1	*l.* 1.2
65|9	68|9	65|9	164|75
	|4	|2 1/2	263|6
			329|5
329|5	263|6	164|95	757|85

2. Example.

A Ship-carpenter bought 300 timber trees of a Gentleman, and was to pay for the first 100 a summe of money vnknowne, for the second twice asmuch as for the first 100, and for the third 100 of trees hee was to pay thrice asmuch as he paid for the first, and the whole 300 of trees cost him 724 pound, 12 shillings, the question is, what each hundred cost him seuerally? To work this question, or any other of like nature, suppose a vnite, or one pound for the first 100, then he must pay 2 pound for the second 100, which is twice as much, and then also he must pay 3 pound for the third hundred, which is three times as much as the first: but yet 1 pound, 2 pound, and 3 pound makes but 6 pound, and it should be 724 pound, 12 shillings; so that now whereas in the former Booke I taught you to resort to the Golden Rule for the answere, saying; If 6 pound come of my position 1 pound, of what comes 724 pound, 12 shillings. Now alwaies supposing a vnite for your first number, you shall saue multiplication; and so diuiding of 724 pound, 6 primes,

primes by 6, I find the first 100 of Trees coſt him 120 pound, 15 ſhillings, 4 pence; and the ſecond 100 coſt him 241 pound, 10 ſhillings, 8 pence; and the third 100 coſt him 362 pound, 5 ſhillings; the total makes 724 pound, 12 ſhillings, behold the worke.

Example.

| | | |

Pay 2 pound, which is twice as much as *A.* doth pay; and *C.* muſt pay 6 pound, which is thrice as much as *B.* doth pay; and then *D.* muſt pay 9 pound, which is as much as all the other three doe pay: but their totall is but 18 pound, and it ſhould be 541 pound, 16 ſhillings: wherefore I diuide 541 pound, 8 primes by 18, and the quotient is 30 pound, 1 prime, or 2 ſhillings for the firſt part. Then *B.* muſt pay 60 pound, 4 ſhillings? *C.* 180 pound, 12 ſhillings; and *D.* 270 pound, 18 ſhillings, their totall makes 541 pound, 8 primes; behold the worke.

Example.

l. 1		*l.*	*s.*
541|8 (30|1	*A.*	30	2
18888	*B.*	60	4
11	*C.*	180	12
	D.	270	18
	The proofe.	541	16

4. *Example.*

A Ceſterne of water containing 600 gallons is filled with water, and hath 4 ſeuerall Cocks to emptie the ſame, whereof if they be all ſet open at once, the Ceſterne will be empty in 24 houres: now the ſecond Cock will auoyde twice as much as the firſt Cock in 24 houres, and the third will auoide three times as much as the firſt, and the fourth Cocke 5 times as much as the firſt; the queſtion is, how many gallons each Cocke doth auoide in 24 houres of the ſaid 600 gallons?

I ſuppoſe the firſt Cock will auoyde one gallon, then the ſecond muſt auoyde 2, and the third 3, and the fourth Cock 5: but yet they are but a 11 gallons, and they ſhould be 600 gallons: wherefore diuiding of 600 by 11, the quotient is 54 gallons, and 6:11 of a gallon for the firſt Cocke. Behold the worke in the example following.

Example.

Example.

1.1	86 Gallons.		Gallons.
2.2	660(54. 6:11		1. 54. 6
3.3	22		2. 109. 1
4.5	2		3. 163. 7
			4. 272. 8
11			2
	22(2	*The proofe.*	600. 22
	22		

Of Gaine and Losse in Decimals.

If a Broad Cloth 28 yards long bee sold for 14 shillings a yard, and the seller doth gaine 10 pound in the 100 ready money, what cost that broad Cloath? First by Practice find the price of the 28 yards, at 14 shillings a yard, makes 19 pound, 6 primes, or 19 pound, 12 shillings; diuide 19 pound 6 primes by 110 pound, makes 17 pound, 81818 fifthes, or in Coyne, 17 pound, 16 shillings, 4 pence, 3 farthings.

Example.

1. Example.

28	8929	*l. 1.2.3.4.5*
7	29|600000	(17|81818
	2222222	
19|6	222222	
	2222	

Secondly, if 28 yards coſt 17 pound, 81818 fifthes, what did one yard coſt at that rate? Diuide 17 pound, 81818 fifthes by 28 yards, and the quotient will be 63636, or in Coyne, 12 ſhillings, 8 pence, 3 farthings for the price that one yard coſt.

Example.

	2221
	2370720 *1.2.3.4.5*
27|81818	(63636
	288888
	2222

Thirdly,

Thirdly, for the proofe of this worke, ſay, If one yard coſt 63636 fifths, how may I ſell it to gaine 10 pound in the hundred ready money? Take the tenth part of 63636 fifths, makes 63636 ſixths; which added into one Totall, makes 69999 fifthes, which doth want but one fifth of 7 primes, or 14 ſhillings, which proues all the former works to be true.

Example.

1.2.3.4.5 6
6 3 6 3 6
6 3 6 3 6

6 9 9 9 9 6

2 *Example.*

A Merchant doth deliuer money at intereſt for 9 monthes after the rate of 12 pound in the hundred for 12 moneths ſimple intereſt, and at the end of 9 moneths doth receiue for intereſt 87 pound; the queſtion is, what was the ſumme lent? Anſwere: becauſe the intereſt of 9 moneths at 12 pound in the hundred is 9 pound, deuide 8700000

by

by 9 pound, and the quotient is 966 pound, 6666 fourths, or 966 pound, 13 ſhillings, 4 pence, the ſumme lent.

Example.

```
 666          l. 1.2.3.4
8700000(966|6666
 999
```

3. *Example.*

If 13 pieces of Canuas coſt 17 pound, 12 ſhillings, how may I ſell them to gaine 8 pound in the hundred? Multiply 17 pound 6 primes by 8, adding two cyphers, makes for 19 pound, 8 thirds, or 19 pound, 2 pence almoſt.

The proofe of the former example, if 17 pound, 12 ſhillings, gaine 1 pound, 8 ſhillings, 2 *d.* what will 100 pound gaine at that rate? Multiply 1 pound, 8 ſhillings, 2 pence; or in Decimals, 1 pound, 408 thirds by 100, makes 140 pound, 800 thirds; which diuide by 17 pound, 6 primes, makes 8 *li.* for the rate that 100 pound will gaine, which ſhewes the former worke to bee truely wrought.

Example.

Example.

```
   l. 1.2.3
 17|600
   |   8
 ---------
  1|408
 ---------
 19|008
```

```
      0    l.
140|800(8 the proofe.
   176
```

4. *Example.*

If in one ell of cloath ſold for 3 ſhillings, there bee gained after the rate of 12 pound in the hundred for 12 moneths, how ſhould that ell haue been ſold to gaine 17 pound in the hundred for 12 moneths? Multiply 17 pound by 3 ſhillings, which is 1 prime, 5 ſeconds, and diuide the product by 12, makes 2125 fourths, or in coyne 4 ſhillings 3 pence, and ſo much muſt it haue been ſold for to gaine 17 pound in the hundred.

Example.

Example.

```
   17
   15
-----      ~~136~~      1.2.3.4
   85      ~~255000~~(2125  or 4s.3d.
  17       ~~12222~~
-----      ~~111~~
  255
```

Secondly, if 3 ſhillings giue 12 pound, what will 4 ſhillings, 3 pence giue? Multiply 2125 fourths by 12, and diuide by 15 ſeconds, and the quotient is 17 pound, the proofe of the laſt example.

Example.

```
 1.2.3.4
 2125        ~~100~~      l.
   12        ~~255~~|00(17
-------      ~~155~~
 555|00       ~~1~~
```

3. *Example.*

5. Example.

A Merchant ſold 24 Clothes, which coſt him 342 pound, wherein hee loſt after the rate of 10 pound in the hundred, and tooke in exchange 560 pieces of Rayſons at 24 ſhillings the piece, wherein hee gained 10 pound in the hundred ready money; now the queſtion is, what his gaine or loſſe was, and what ſumme of money hee was to pay for the Rayſons? Firſt, 560 pieces of Rayſons at 24 ſhillings a piece, is 672 pound; from which ſubtract 342 pound, leaues 330 pound to pay for the Rayſons. Secondly, 672 pound, at 10 pound in the hundred, is 67 pound, 4 ſhillings for his gaines by the Rayſons. Thirdly, 342 pound leſſe, 10 in the hundred, is 34 pound, 4 ſhillings, to be deducted from 342 pound; and then take 34 pound, 4 ſhillings, from 67 pound 4 ſhillings, leaues his gaines more then his loſſe to be 33 pound.

Example.

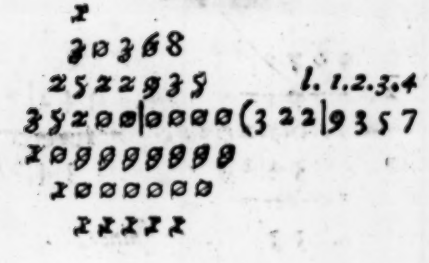
Example.

peeces			
560	672		
12		342	
672 | 0	67 | 2 *gains.*		
342	34 | 2	34 | 2 *losse.*	
330 *to pay.*	33 | 0 *cleare gaines.*		

6. Example.

A Merchant receiueth for principall and intereſt 352 pound, wherein he gained 9 pound in the hundred for one yeare; now the queſtion is, what was the ſumme of money lent? Diuide 35200|000 by 109 pound, makes 322 pound, 9357 fourths, or 322 pound, 18 ſhillings, 8 pence, half-peny for the ſumme lent.

6. Example.



7. Example.

A Merchant hath owing vnto him, 540 pound, to be paid at the end of three yeares, now his debtor will pay him ready money, if he will abate him 9 pound in the hundred. Diuide 540 pound with Cyphers by 109 three times one after the other, and the third quotient will be the ſumme that hee ſhall pay in ready money, abating 9 pound in the hundred intereſt vpon intereſt. Behold the worke following.

Example.

7 *Example.*

```
  5413
1049541
54000|000(49541200
10999999
 100000
  1111

   450
  59057
 49541|200(454506
 1099999
  10000
   111

   1
  70843
 1866174        l.1.2.2
45450|600 (416|974
10999999
 100000
  1111
```

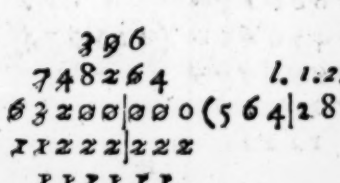
or 416 *l.* 19 *s.* 6 *d.*

The proofe is made by multiplying the laſt quotient by 9, and that product againe by 9, and thirdly againe by 9, makes 540 pound, wanting but one fifth, which is but 3:1750 parts of 1 penny, or 6:875 parts of one farthing.

8. *Example.*

A Merchant hath owing vnto him 632 pound, to be paid at the end of 12 monthes, now his debter will pay him ready money, if he will abate him 12 pound in the hundred *per annum*? Diuide 632 by 112 pound, and the quotient will be the ſumme of money that will diſcharge the debt, abating 12 pound in the hundred.

Example.



l. 1.2.3

or 564 *li.* 5 *s.* 8 *d. ob.*

9. *Example.*

9. Example.

324 pound was receiued for intereſt money lent a Merchant Aduenturer at 17 pound in the hundred one yeare, what was the ſumme lent? Anſwere: diuide 32400 by 17, makes 1900 pound, and 1:17 of a pound.

10. Example.

If 358 ells of Holland caſt 124 pound, 16 ſhillings, how ſhal it be ſould an ell to gaine 12 pound in the hundred ready money? Firſt multiply 124 pound, 8 primes by 12, adding two cyphers, makes 139 pound, 776 or in Coyne 139 pound, 15 ſhillings, 6 pence. Secondly, diuide 139 pound, 776 by 358, makes 3905 fourths, or 7 ſhillings, 9 pence, 3 farthings for the price to ſell one ell to gaine 12 pound in the hundred.

Example.

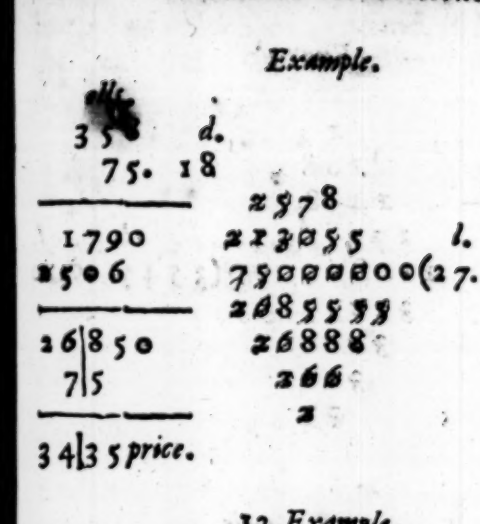
l. 1. 2. 3			
124	800	21	
	12	3235	*1. 2. 3. 4*
		23977600	(3905
14976		358888	
		3553	
139776		33	

11. *Example.*

If one ell of cloth coſt 18 pence, how ſhall I ſell 358 ells to gaine 7 pound, 10 ſhillings by the bargaine, and at what rate in the hundred doe I gaine? Firſt, 358 ells at 18 pence an ell makes 26 pound, 17 ſhillings; to the which adde 7 pound, 10 ſhillings, the gaines makes 34 pound, 7 ſhillings, for to ſell 358 ells, to gaine 7 pound, 10 ſhillings by the bargaine. Secondly, diuide 7 pound 500000 ſixths by 26 pound, 85 ſeconds, and the qnotient is 27 pound, 9346 fourths, or 27 pound, 18 ſhillings, 8 pence farthing, which is the rate gained by the 100 pound of money.

Example.

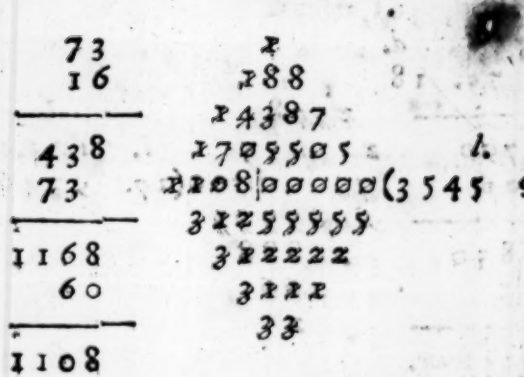
Example.



12. *Example.*

How much Indicoe of 6 ſhillings, 3 pence a pound wil pay for 73 broad clothes at 16 pound one cloth, and to pay 60 pound in preſent money? Firſt, 73 broad clothes at 16 pound a cloth makes 1168 pound, from which ſubtract 60 pound, there will remaine 1108 pound; which diuide by 6 ſhillings, 3 pence, or 3125 fourths, and the quotient is 3545 pound, 9:10 of one pound, and ſo much muſt he giue of Indicoe for the clothes.

Example.



13. *Example.*

How many pounds of Cloues at 6 ſhillings a pound, and ſmall Sinamond of 3 ſhillings a pound muſt bee giuen for 36 Carſeyes, at 4 pound, 3 ſhillings a piece, to haue of each a like number of pounds? Anſwer: 36 Carſeys at 4 pound, 3 ſhillings a piece, makes 149 pound, 8 ſhillings; which diuided by the price of both, *viz.* 9 ſhillings, makes 332 pound of each ſort.

The proofe: 332 pound of Cloues at 6 ſhillings a pound, makes 99 pound, 12 ſhillings; then 332 pound of Sinamon at 3 ſhillings,

lings a pound, makes 49 pound, 16 ſhillings, the total is 149 pound, 8 ſhillings, the giuen price of the 36 Carſeys.

l. 1.2 *Example.*

```
  4|15
   |36
 ------
 24|90
124|5
 ------
149|4
```

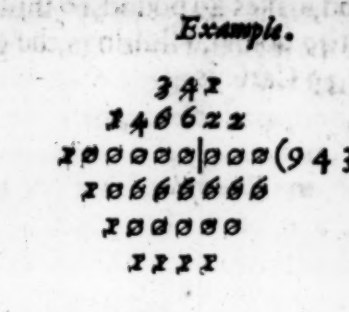
```
  149
149|4000 (332 l. of each.
  4555
   44
```

14. *Example.*

Of what principall came 1000 pound principall and intereſt, at compound intereſt in three yeeres at 6 pound in the hundred? Diuide 1000 pound three ſeuerall times by 106, makes 839 pound 61 ſeconds, or 839 pound, 12 ſhillings, 3 pence almoſt, which was the ſumme lent at firſt.

Example.

Example.



15. *Example.*

If 34 Tun of wine coſt 544 pound, how may a man ſell a Tun to gaine 12 pound vpon the hundred ready money? Firſt, find the price

price of one Tun, diuiding 544 by 34, makes 16 pound for the price of one Tun which it cost; then multiply 16|00 by 12 pound, makes 17 pound, 92 seconds, or 17 pound, 18 shillings, 4 pence, 4:5 of a penny, for the price to sell one Tunne of that Wine to gaine 12 pound vpon the 100 pound.

```
                                  1.2
 20      l.                 16|00
 544 (16                     |12
 344                        ------
  3                          1|92
                            ------
                            17|92
```

How to worke gaine and losse in pence, and parts of Pence or Farthings.

Set out your number of pounds, shillings, pence and farthings in pence, and in tenths of one penny; and for one farthing, set out 2 primes, 5 seconds, which is one fourth of a penny, and for two farthings set out fiue primes, which is one halfe penny; and for three farthings set downe 7 primes, 5 seconds, which is three quarters of one penny, and then they are apt for decimall operations

rations both for multiplication, diuiſion, or any other worke of Arithmatick, without reducing them into farthings, and there will bee a great deale of labour ſaued in theſe kinds of operations, as ſhall appeare afterwards by the examples following.

1. *Example.*

What is the intereſt and principall of 100 pound, put forth at 10 pound in the 100 compound intereſt, for the ſpace of 7 yeares to bee all receiued at the end of the terme? Firſt, put your 100 pound into pence, maker 24000 pence; then worke as in this example following, and you ſhal find it will amount vnto 46769 pence, and 1:5 of one penny; which diuided by 240 pence, makes 194 pound, 17 ſhillings, 5 pence, 1:5 of a penny, which is the ſumme that 100 pound will amount vnto at intereſt vpon intereſt in 7 yeares at 10 pound in the hundred.

Example.

Example.

pence.

100 pound makes	24000	
	2400	
1 Yeare	26400	
	2640	0
2 Yeare	29040	
	2904	0
3 Yeare	31944	0
	3194	40
4 Yeare	35138	40
	3513	84
5 Yeare	38652	24
	3865	224
6 Yeare	42517	464
	7461	2104
7 Yeare	46769	2104

Totall.

x 21 d.
22207 l. 1
467690(194. 8
x44440
222

Totall 194 l. 17 s. 5 d. 1:5

2 *Example.*

A Merchant deliuered 358 pound at intereſt for three yeares for 8 pound in the hundred compound intereſt; the queſtion is, what it wil amount vnto at the end of the terme? Put your money into pence, makes 85920 pence; which multiply by 8, adding 2 Cyphers, and worke for three yeares, as in the example following.

Example.

Example.

		d.
358 pound is——	85920	00
		8
	6873	60
1 Yeare——	92793	600
	0000	008
	7423	488
2 Yeare—	100217	08800
	00000	00008
	8017	36704
3 Yeare—	108234	45504*d.*

22 18*d.* *l.* 1
108234 0 (450 | 9 or 450 *l.* 19*s.* 6*d.*
244440
222

The

The proofe of the former example in Decimals.

A certaine Merchant receiued for principall and intereſt vpon intereſt 450 pound 19 ſhillings, 6 pence, which was for money lent at 8 pound in the hundred for three yeeres; now the Queſtion is, what was the ſumme lent? Place 450 pound, 19 ſhillings, 6 pence in Decimals, and yon will find your third quotient will be 358 pound, wanting ſome few ſeconds, which prooues the work good.

3. *Example.*

A Merchant lent 112 pound for 6 months at 17 pound in the hundred, for 12 months, the queſtion is, what he ſhall receiue? Put your money into pence, makes 26880 pence; marke out your prime line, as in the former examples, and adde two cyphers, then multiply by 17, and take halfe that product for 6 moneths intereſt, and adde into the principall, and the totall is the ſum of pence which hee ſhall receiue for principall and intereſt at 6 moneths end.

Example.

Example.

112 pound is—2 6 8 8 0|0 0
0 0 0 0|1 7

2 6 8 8|6
1 8 8 1|0

4 5 6 9|6 *totall.*

2 2 8 4|8 *one halfe added.*

2 9 1 6 4|8 *the ſumme ſought.*

Makes 121 *li.* 10*ſ.* 4 *d.* 4:5 of a *d.*

4. Example.

If a pound of Sinamond coſt 4 ſhillings ready money, how may it be ſold to gaine 12 pound in the hundred to giue 6 moneths time? Set your 4 ſhillings in pence, makes 48 pence; then adde 2 Cyphers, and multiply by halfe the intereſt, and adde them into one ſumme, and the product will bee 50 pound, 88 ſeconds, or 4 ſhillings, 2 pence, 4:25 of one penny for the price to ſell one pound to gaine 12 pound in the hundred for 6 moneths time.

4. *Example.*

```
 d.|1.2
48|00
  |  6
-------
  2|88
-------
 50|88
```

Makes 50 pence, 9:10 of a penny almost.

5. *Example.*

If 112 pound waight of Cloues cost 33 pound, 12 shillings, how may I sell them to gaine 14 pound in the hundred, and giue 4 moneths time? First, set downe 33 pound, 6 primes; then adde 2 Cyphers, and multiply by 14, makes 4 pound, 704 thirds, of which take the third part, because 4 moneths is the third part of one yeare, which is 1 pound, 568 thirds; which added into one totall, makes 35 pound, 3 shillings, 4 pence, halfpenny for the price to sell 112 pound to giue 4 moneths time, and to gaine 14 pound in the 100 in 12 moneths.

Example.

5. Example.

33|600
14

1|344
3|36

4|704

1|568

35|168

6. Example.

If I gaine 8 pound, 15 ſhillings in 100 pieces of Linnen cloth, what doe I gaine in the 100 at that rate, when as the 100 pieces are ſold for 52 pound 10 ſhillings? Firſt, ſubtract 8 pound, 15 ſhillings, from 52 *l.* 10 *s.* and there will remaine 43 *l.* 15 *s.* then ſay, If 43 pound, 15 ſhillings gaine 8 pound, 15 ſhillings, what will 100 pound gaine? Diuide 875000 by 43 pound, 15 ſhillings, or 43 pound, 75 ſeconds, and the quotient will be 17 *l.* 14 *s.* 4 *d.* in the 100.

7. *Example.*

If in 112 pound waight of Sugar, ſold for 7 pound, 12 ſhillings ready money, there were gained 11 pound in the hundred, what did one pound coſt at firſt penny? Firſt, di- 7 pound, 6000000 by 111 pound, which is the principall and intereſt giuen, and the quotient is 6 pound, 84684 fifthes, which 112 pound coſt ready money. Secondly, diuide that quotient by 112 pound, makes 61132 ſixths, or 14 pence, 3 farthings for the price that one pound coſt at firſt penny.

8. *Example.*

If 300 pieces of Lawne coſt 321 pound, 4 ſhillings, how may I ſell them to looſe 15 pound in the hundred? Firſt, take the rate what one coſt, by diuiding 321 pound, 2 primes by 300, makes 1 pound, 0706666 ſeuenths, or 1 pound, 1 ſhilling, 5 pence almoſt fo. the price that one piece coſt. Secondly, take the intereſt of 1|0706666 ſeuenths at 15 pound in the 100, and ſubtract it, and then makes 91006 ſixths, or 18 ſhillings, 2 pence, 2:5 of a penny for the price

to

to sell one piece to loosse 15 pound in the 100 ready money. Thirdly, for the proofe of this work, say; If one piece cost 910067 sixths, what will 300 pieces cost at that rate? Multiply 910067 sixths by 300, and cut off 6 figures to the right hand, makes 273 pound, 5 pence almost for the sum receiued for 300 pieces to loose 15 pound in the 100. Fourthly, for a second proofe; take the interest of 321 pound, 2 primes at 15 pound in the hundred losse, and deduct it from 321 pound, 2 primes, and there will remaine 273 pound, 5 pence almost, which doth proue all the other workes to be truely wrought.

Example.

```
          22222        l. 1.2.3.4.5.6
   321|2000000 (1|706666
   3333333300

107666600          1.2.3.4.5.6
       15          910067
-----------            300
   160599        ----------
-----------    273|020100
   910067
```

		1.2.3
3	2 1	2 0 0
		1 5
	4 8	1 8
2 7 2	0 2	

The proofe.

9 Example.

If in one ell of Cloth ſold for 3 ſhillings, 2 pence, half-penny, there were gained 10 pound in the hundred ready money, what did that ell coſt? Anſwere: ſet 3 ſhillings 2 pence *ob.* in decimals, makes 38 pence, 5 primes; then diuide 38 pence, 5000 fourths by 110 pound, makes 35 pence, the price that one ell coſt.

Example.

5
38|5000 (35 pence, the price
2200 one coſt.
220

Example.

10. *Example.*

If in one ell of Cloth ſold for 35 pence, 19 ſeconds, there were gained 7 pound in the hundred ready money, what did that ell coſt, when there was 6 moneths time giuen? Diuide 35 pound, 1900 fourths by halfe the intereſt, adding one 100, which is 103 pence, 5 primes, and the quotient is 34 pence, the price that the ell coſt.

474 *d.*
35|1900 (34
1035
103

11. *Example.*

A Merchant lent money at 10 pound in the hundred for 100 pound profit for 12 moneths, and at the end of 6 moneths he receiued principall and intereſt 356 pound, the queſtion is, what was the ſumme lent? Diuide 356 pound, by 105 pound, which is the halfe yeares Intereſt and principall, and the quotient is 305 pound, 5:105 of a pound for the ſumme lent.

Example.

```
   9
  4155      l.
35600(339.   5:105 of a l.
10555
 100
  1
```

12. *Example.*

If 17 pound loose 12 shillings, what will 100 pound loose? Diuide 60000 fifthes by 17, makes 3 pound, 529 thirds, or 3 pound 10 shillings, 7 pence in the hundred pound.

13. *Example.*

If 37 yards of veluet cost 32 pound, how must one yard bee sold to gaine 9 pound, 10 shillings in the hundred? First, 32 pound the price at 9 pound, 5 primes the hundred, makes 35 pound, 4 seconds; which diuide by 37, makes the price of one yard to bee 94702 fifthes, or 18 shillings, 11 pence, *ob.* to sell one yard to gaine 9 pound, 10 shillings in the hundred.

Example.

l. 1.2.3

3 2|0 0 0
| 9 5

2|1 6 0
|8 8

3 5|0 4 0

Example.

z

z 7 6 1 *1.2.3.4*

3 5 0 4 0 0 (9 4 7 0
3 7 7 7
3 3

or 18 *l.* 11 *d. ob.*

Exchange in Decimalls.

1. *Example.*

IF one pound ſterling be 1 pound, 14 ſhillings, 6 pence Flemiſh, what is 783 pound ſterling in Flemmiſh money? Set out 1 pound, 14 ſhillings, 6 pence in Decimalls, makes 1 pound, 725 thirds; which multiply by 783 pound, makes 1350 pound, 675 thirds, or 1350 pound, 13 ſhillings, 6 pence.

Example.

Example.

l.	*1.2.3*
1	7 2 5
	7 8 3
5	1 7 5
1 3 8	0 0
1 2 0 7	5
1 3 5 0	6 7 5

1.2.3
2 7 5
7 8 3
8 2 5
2 2 0 0
1 9 2 5
2 1 5 3 2 5

l.	*1.2.3*
2 1 5	3 2 5
1 3 5 0	6 7 5
1 5 6 6	0 0 0

The proofe.

2 Example.

If one pound exchange be 5 ſhillings, 6 pence, what is 783 pound? Set 5 *s.* 6 *d.* in Decimals, makes 275 thirds; which multiply by 783, makes 215 pound, 325 thirds, or 215 pound, 6 ſhillings, 6 pence; which added to the laſt example, is 1566 pound, and ſo much is the double of the ſumme giuen,

viz.

viz. of 781 pound, becauſe the two prices giuen, makes iuſt 2 pound, and this by working a ſecond queſtion in exchange, the firſt is prooued to be truly wrought, as appeareth in the example aboue.

3. *Example.*

If one pound exchange be 1 pound, 17 ſhillings, 7 pence, half-penny, what is 1000 pound at that rate? Set 1 pound, 17 ſhillings, 7 pence, half-penny in Decimalls, makes 1 pound, 88125 fifthes; then becauſe 1000 hath 3 Cyphers, adde 3 Cyphers, and cut off 5 figures, and the anſwere is 1881 pound, 5 ſhillings.

1 8 8 1	1.2 2 5 0 0 0

4 *Example.*

A Merchant doth receiue 134 pound, 6 ſhillings for the exchange of one hundred pound ſterling from Middleborough, what was one pound ſterling in Flemmiſh mony? Place 134 pound, 6 ſhillings in Decimalls, is 134 pound, 3 primes; then becauſe 100 pound

pound hath 2 Cyphers, cut off two figures more to the left hand, and it wil be 1 pound, 347 thirds; or in Coyne, 1 pound, 6 ſhillings, 11 pence, farthing for the exchange of one pound at that rate.

l. 1.2.3	*li.*	*s.*	*d.*	*q.*
1|348	or 1.	6.	11.	1

5. Example.

A Merchant doth receiue 645 pound, 12 ſhillings for exchange money, at 1 pound, 7 ſhillings, 6 pence for one pound ſterling, the queſtion is, how much ſterling money he did deliuer? Diuide 645 pound, 6 primes by 1 *li.* 375 thirds, or 1 pound, 7 ſhillings, 6 pence, makes 469\|5268 fourths, or 469 pounds, 10 ſhillings, 6 pence, 1 farthing for the ſterling money deliuered.

6 Example.

If 1 *l.* ſterling be 1 *l.* 7 *s.* 6 *d.* Flemmiſh, what is 110 *l.* Flemmiſh in Sterling Coine? Diuide 100 pound by 1 pound, 375 thirds, makes 72 pound, 72727 fifths; or 72 pound 14 ſhillings, 6 pence, *ob.* that 100 *l.* makes.

7 Example.

7. Example.

If the exchange bee from Rome to London at 69 pence sterling one Duckat, how many Duckats shall bee deliuered at Rome for to receiue 356 pound, 16 shillings sterling at London? Answere? Diuide 356 pound, 8 primes by 2875 fourths, which is 69 pence, and the quotient will bee 1241 Duckats, 3 pence.

```
      3 1
    2 2 8 0 2
    6 9 3 0 0 5
3 5 6|8 0 0 0 (1 2 4 1  Duckats, and
2 8 7 5 5 5 5           there remaines 3 d.
  2 8 7 7 7
    2 8 8
      2
```

8. Example.

If the exchange bee from London vnto Antwerpe at 23 shillings, 5 pence, 3 farthings Flemmish the pound sterling, how much money must be deliuered at London, to receiue 146 pound, 14 s. 10 pence, 3 q. in

in Flemmiſh money? Anſwere: Diuide 146 pound, 744775 ſixthes, by 1 pound, 3 ſhillings, 5 Pence, 3 farthings; which is 1 pound, 1739582 ſeuenths, and the quotient is 125 pound; and ſo much muſt he deliuer at London to receiue 146 pound, 14 ſhillings, 10 pence, 3 farthings in Flemmiſh Coyne at that rate.

Example.

```
   586979
  29348951        l.
146|7447750(125
117395822 2
 11739588
  117395
```

9. Example.

A Merchant doth deliuer at Antwerpe 200 pound Flemmiſh by exchange for London at 22 ſhillings, 10 pence Flemmiſh for one pound ſterling, how much muſt hee receiue at London? Anſwere: diuide 200 pound by 1 pound, 141666 ſixths, which is 22 ſhillings, 10 pence; makes 175 pound.

A generall Rule for exchange in Decimals.

If the price of a vnite be giuen, then alwaies diuide the ſumme of money whereon the queſtion dependeth by that vnite in decimalls, and the quotient is the anſwere to the queſtion.

1. *Example.*

A Merchant doth deliuer 100 pound ſterling by exchange for Rome, at 72 pence ſterling for one Duckat *De Camera*; the queſtion is, how many Duckets he muſt receiue at Rome for his 100 pound ſterling? Heere the price of one Ducket is giuen to bee 72 pence, which is 6 ſhillings, or 3 primes; wherefore I diuide 100 pound by 3 primes, and the quotient is 333 pound, 1:3 of a pound, or 6 ſhillings, 8 pence for anſwere to the queſtion.

Example.

2. *Example.*

A Merchant doth deliuer 756 pound sterling at London, to receiue Duckets at 66 pence sterling, the price of one Dueket, the question is, how many Duckets he must receiue at Venice? Diuide 756 pound by 66 pence, which is 275 thirds, and the quotient is 2748 Duckats, and 300:2750 of one Ducket for the Answere.

3. *Example.*

A Merchant at Venice doth deliuer 1000 Duckats, to receiue at London 287 pound, 10 shillings sterling, what is one Ducket? Set downe 287 pound, 5 primes, and diuide by 1000 Duckets, makes at 5 shillings, 9 pence for one Ducket.

```
                 1.2 3.4
287|5000(2875
1000000
 111
```

Makes 5 *s.* 9 *d.* one Ducket.

4. *Example.*

4. Example.

A Merchant at Venice doth deliuer 800 Ducketts by Exchange for London at 64 pence, ob. the ducket sterling money, the question is, how much sterling he must receiue at London? Set out 64 pence halfpenny in Decimals, makes 26875 fifthes; which multiply by 800, and cut off 5 figures because your fractions are 5, and the product will be 215 pound sterling.

1.2.3.4.5
26875
800

215|00000

Makes 215 pound sterling.

5. Example.

A Merchant doth deliuer 1000 duckets by Exchange for London at 71 pence sterling for one ducket, how much must hee receiue sterling money at London? Set out 71 pence in decimalls, makes 2958 fourths,

1:3, and adde 3 Cyphers for 1000, and cut off 4 figures, makes 295 pound, 8 primes 1:3, or 295 pound, 16 shillings, 8 pence for the answere.

l.	1	
295	8000	Makes 295 l. 8 primes, 1:3

6. Example.

One penny Flemmish is 3:5 of one penny sterling, and one pound Flemmish is 3:5 of one pound sterling or 12 shillings; wherefore to conuert Flemmish money into sterling Coyne, multiply your Flemmish mony by 3:5, which in decimals is 6:10, or 6, and the product will bee the value of your Flemmish money in sterling Coyne. In 345 Flemmish, how much sterling Coyne? Multiply 345 by 6 primes, and the product is 207 pound sterling.

	l.	1
In	345	
		6
	207	0

	l.	12
In	7856	6
		62
	4714	08

7. Example.

7. *Example.*

In 756 pound, 18 ſhillings ſterling, how much Flemmiſh coyne, when one penny Flemmiſh is :5 of a penny Engliſh? Deuide 756 pound, 9 primes by 6 primes, makes 1261 pound, 5 primes, or 10 ſhillings.

```
1303          li. 1
75690(1261    5
66666
```

Reduction of Meaſures from one place to another.

IF you will reduce the meaſure of one Country into the meaſures of another As if you would reduce the meaſures of *Antwerpe, Gaunt, Brudges, Siuill, Roauen*, or of any other Countrey, into the meaſures at *London*; learne firſt the order of meaſuring of all ſorts of commodities in both places, either out of the experience of Merchants and Tradeſmen in thoſe places, or out of the beſt and lateſt approued Authors that haue

written Tables to that effect and note, that 4 ells at London makes 5 yards, and 100 ells at London is at.

	Ells.
Antwerpe	166 ⅔
Gaunt short measure	164
Gaunt long measure	154
Bruges	164
Arras	165
Calice	157
Lisse	166
Maestricht	173
Cullen	208
Franckfort	208
Norembergh	174
Dantringe	139
Rouen	103
Paris	95
Lions	100

Genua		480 ¾ Palmes.
Millan		214 Braces.
Florence		188 Braces.
Venice	for Silke hath	196 Ells.
	for Linnen hath	180 Ells.
Rome		56 Cana.
Lisborne		100 Varras.

Madera

Madera ——— 104 Varras.
Seuile ——— 135 Varras.

These I haue taken out of Maſterſons *Arithmaticke.*

The difference of one hundred Ells, Palmes, Varras, or Braces, being found of any place from London; if you would conuert the meaſures of any of thoſe places to London meaſure: as for example, If you would conuert 356 ells of Brudges meaſure into ells at London; you ſhall find in the Table, that 164 ells make 100 at London; then by the Rule of Three ſay,

1. Example.

If 164 be 100, what are 356 ells? Multiply 356 by 100, and diuide by 164, makes 217 ells, 12:164 of an ell, which 356 at Brudges will make in London. But according to the order of decimalls, if you will bring the meaſures of other places to thoſe of London? Set your numb.r of one hundred found in the Table, to a vnite in decimalls, as in the laſt example 164 ſtands thus 1|64 ſeconds, then you neede but diuide

1:3, and adde 3 Cyphers for 1000, and cut off 4 figures, makes 295 pound, 8 primes, 1:3, or 295 pound, 16 shillings, 8 pence for the answere.

l. 1	
295	8000

Makes 295 *l.* 8 primes, 1:3

6. Example.

One penny Flemmish is 3:5 of one penny sterling, and one pound Flemmish is 3:5 of one pound sterling or 12 shillings; wherefore to conuert Flemmish money into sterling Coyne, multiply your Flemmish mony by 3:5, which in decimals is 6:10, or 6, and the product will bee the value of your Flemmish money in sterling Coyne. In 345 Flemmish, how much sterling Coyne? Multiply 245 by 6 primes, and the product is 207 pound sterling.

l. 1	
In 345	6
207	0

l. 12	
In 7856	6
	62
47140	8

7. Example.

7. *Example.*

In 756 pound, 18 ſhillings ſterling, how much Flemmiſh coyne, when one penny Flemmiſh is [illegible]5 of a penny Engliſh? Deuide 756 pound, 9 primes by 6 primes, makes 1261 pound, 5 primes, or 10 ſhillings.

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1303          li.  1
75690(1261         5
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written Tables to that effect and note, that 4 ells at London makes 5 yards, and 100 ells at London is at

	Ells.
Antwerpe	166 $\frac{2}{3}$
Gaunt short measure	164
Gaunt long measure	154
Brudges	164
Arras	165
Calice	157
Lisse	166
Mastricht	173
Cullen	208
Francfort	208
Norembergh	174
Dantringe	139
Rouen	103
Paris	95
Lions	100

Genua		480 $\frac{2}{3}$ Palmes.
Millian		214 Braces.
Florence		188 Braces.
Venice	for Silke hath	196 Ells.
	for Linnen hath	180 Ells.
Rome		56 Cana.
Lisborne		100 Varras.

Madera

Madera ——— 104 Varras.
Seuile ——— 135 Varras.

These I haue taken out of Maſterſons *Arithmatick.*

The difference of one hundred Ells, Palmes, Varras, or Braces, being found of any place from London; if you would conuert the meaſures of any of thoſe places to London meaſure: as for example, If you would conuert 356 ells of Brudges meaſure into ells at London; you ſhall find in the Table, that 164 ells make 100 at London; then by the Rule of Three ſay,

1. *Example.*

If 164 be 100, what are 356 ells? Multiply 356 by 100, and diuide by 164, makes 217 ells, 12:164 of an ell, which 356 at Brudges will make in London. But according to the order of decimalls, if you will bring the meaſures of other places to thoſe of London? Set your number of one hundred found in the Table, to a vnite in decimalls, as in the laſt example 164 ſtands thus 1|64 ſeconds, then you neede but diuide

your number 356 by 1 pound, 64 seconds, and the quotient is 217 ells, 12.164 ells, as in the last example.

Againe, if you would reduce London measure to the measures of any other place? Find the number of 100 to that place, and set it decimalls, and multiply your number of ells at London by those numbers found, and the product will be your desire.

2. Example.

In 758 ells at London, how many ells at Dantzing, I find in the Table 139 ells there make 100 at London; so I set 139 to a vnite, and it is 1 pound, 39 seconds; by which I multiply 758, makes 1053 ells, 62:100 parts.

1. Example.

```
 111
 2862 Ells.
35600|217. 12:164
16444
 166
  3
```

2. Example.

```
 758|00
   1|39
 ----------
  68|22
 227|4
 758|
 ----------
1053|62
```

3 Example.

3. *Example:*

If 166 ells 2:3 at Antwerp be 100 ells at London, how many ells at London are 1756 ells at Antwerpe? Set 166, 2:3 to a vnite, makes 1 pound, 66 seconds, and 2:3 of a second: Or otherwise; 1 ell, and 2:3 of one ell, by which diuide 1756, makes 1053, 1:2

```
     5070
    894702        Ells.
1756000000(1053   1:2 almost.
16666666
 166666
  1666
   16
```

4. *Example.*

In 3258 ells at London, how many Braces at Millian? Find 214 for 100 at London, so that if you set 214 to a vnite, it will be 2 pound, 14 seconds; by which multiply 3258, makes 6982 Braces, and 12:100 parts of a Brace.

And in this manner you may easily conuert your Measures or Waights from one place to another, either by Multiplication

or Diuiſion, without the Golden Rule: but of this, if it pleaſe God to lend me life and health, I doe purpoſe to ſpeake in a Treatiſe at large of Decimall Arithmatick for the good of my Country-men and others, if I find theſe my labours and indeauours to be acceptable and beneficiall to others, and will better informe my ſelfe by Merchants, who haue had experience in the Reduction of Waights and Meaſures from place to place; in the meane time here is a foundation laid to worke vpon; let the difference be what it will, and ſo for this time I will end this Treatiſe of Decimall Arithmatick, and goe in hand with ſome operations of Annuities, as followeth.

Of

Of Interest and Annuities.

How to frame Tables to worke Interest and Annuities, or Purchases at any rate.

FOrasmuch as these kind of operations of Interest and Annuities are very tedious and troublesome, if they be to bee wrought for many yeares, although I haue already in the former Booke set forth many seuerall manners of working those kind of questions after a more easie kind of method, then heretofore hath been published by any other in the like kind whatsoeuer yet here I haue thought good also in this place to shew the wayes, whereby any man that is desirous to bee satisfied in the reasons or grounds of those kind of workes, may be able to calculate for his owne vse a Table or Tables, whereby to abreuiate those kind of operations by Multiplication, or Diuision, onely without the helpe of the Golden Rule, or any tedious Reductions of Multiplications and Diuisions for many yeares to come at one

one onely operation, as ſhall appeare by the examples following.

How to calculate the Table or Breuiat of 10 pound in the hundred Compound Intereſt.

If you will calculate a table for 10 pound in the hundred compound Intereſt for 21 or 30 yeares? Place your numbers, as in the examples following, beginning with a vnite, or 1, adding 7 Cyphers vnto it, and then take the tenth part of that, which is the ſame numbers one roome more to the right hand, and adde them into the firſt numbers, and the totall will be the ſumme for the firſt yeare, and ſo you muſt work for the ſecond, third, fourth, &c. vntill 21, or 30 yeares: but here you ſhall note, that you ſhall not neede to ſet downe in your Breuiate more then 8, 9, or 10 numbers at the moſt, for becauſe the reſt wilbe ſuperfluous, as for example.

Example.

Example.

Int.	1.2.3.4.5.6.7.8	Fer.	Int.	1.2.3.4.5.6.7.8	Fer.
1	00000000	0	2	35794769	9
	1			23579476	
1	10000000	1	2	59374246	10
	11			25937424	
1	21000000	2	2	85311670	11
	121			28531167	
1	33100000	3	2	13842837	12
	1331			31384283	
1	46410000	4	3	45227121	13
	14641			34522712	
1	61051000	5	3	79749833	14
	16105 1			37974983	
1	77156100	6	4	17724816	15
	17715 61			41772481	
1	94871710	7	4	59497298	16
	19487171			45949729	
2	14358881	8	5	05447028	17
	21435888			50544702	
2	35794769	9	5	55991731	18
				55599173	
		6		11590904	19

Here

Here you may ſee in this Table the manner of gathering the Breuiate of 10 pound in the hundred, Compound intereſt, which you may extend to what number of yeares you pleaſe, only adding a vnite in the eight place, as you ſee the figures in the ninth place doe ariſe, and now I will here ſet downe the Breuiate from one yeare vnto 40 ready gathered.

The Breuiate of 10 pound in the hundred for 40 Yeares.

Yeeres	1.2.3.4.5 6.7.8	Yeeres	1.2.3.4 5.6.7 8.9
1	1 1 0 0 0 0 0 0	21	7 4 0 0 2 4 9 9 0
2	1 2 1 0 0 0 0 0	22	8 1 4 0 2 7 4 9 0
3	1 3 3 1 0 0 0 0	23	8 9 5 4 3 0 2 4 0
4	1 4 6 4 1 0 0 0	24	9 8 4 9 7 3 2 6 0
5	1 6 1 0 5 1 0 0	25	1 0 8 3 4 7 0 5 9
6	1 7 7 1 5 6 1 0	26	1 1 9 1 8 1 7 6 5
7	1 9 4 8 7 1 7 1	27	1 3 1 0 9 9 9 4 1
8	2 1 4 3 5 8 8 8	28	1 4 4 2 0 9 9 3 6
9	2 3 5 7 9 4 7 6	29	1 5 8 6 3 0 9 2 9
10	2 5 9 3 7 4 2 4	30	1 7 4 4 9 4 0 2 2
11	2 8 5 3 1 1 6 7	31	1 9 1 9 4 3 4 2 4
12	3 1 3 8 4 2 8 3	32	2 1 1 1 3 7 7 6 6
13	3 4 5 2 2 7 1 2	33	2 3 2 2 5 1 5 4 3
14	3 7 9 7 4 9 8 3	34	2 5 5 4 7 6 6 9 7
15	4 1 7 7 2 4 8 1	35	2 8 1 0 2 4 3 6 7
16	4 5 9 4 9 7 2 9	36	3 0 9 1 2 6 8 0 3
17	5 0 5 4 4 7 0 2	37	3 4 0 0 3 9 4 8 4
18	5 5 5 9 9 1 7 3	38	3 7 4 0 4 3 4 3 2
19	6 1 1 5 9 0 9 0	39	4 1 1 4 4 7 7 7 5
20	6 7 2 7 4 9 9 9	40	4 5 2 5 9 2 5 5 3

How

How to calculate a Table or Breuiate at any rate vnder or aboue 10 pound in the hundred, Compound Intereſt.

If you would calculate a Table or Breuiat any rate vnder or aboue 10 pound in the hundred compound intereſt, place a vnite with ſeuen Cypheres to it; then if you will calculate for 12 pound in the hundred, or 16 pound; ſet your 12, or 16 vnder the 2 firſt Cyphers next the vnite, and multiplie your vnite, omitting the cyphers by your intereſt, and adde the product into one totall, and the ſumme is the principall and intereſt for the firſt yeare, and ſo worke againe for the ſecond, third, &c. to finiſh your Table, as aforeſaid, at 10 pound in the hundred. But if your intereſt bee vnder 10 pound in the hundred, place your number of the intereſt vnder the ſecond Cypher from your vnite, and worke as is in the example following.

Example.

Example.

Int.	1.2.3.4.5.6.7.8	Yeares	Int.	1.2.3.4.5.6.7.8	Yeares
1	00000000 80		1	36048896 8	4
1	08000000 8	1		10883904	
	864		1	46932800 8	5
1	16640000 8	2		1175462	
	93312		1	5868743 8	6
1	25971290 8	3	1	7138242	7
	16077696				
1	36048896	4			

In this manner you may proceede infinitely: and thus much shall suffice for making of these Breuiats.

The Breuiat of 8 *pound in the hundred* per annum *Compound Intereſt for* 30 *yeares.*

Yeers	1.2 3.4.5.6.7.8	Yeeres	1.2.3.4.5.6.7.8.9
1	1 0800 0000	16	3 4259 4260
2	1 1664 0000	17	3 7000 1800
3	1 2597 1200	18	3996 1940
4	1 3604 8896	19	4315 7100
5	1 4693 2800	20	4660 9571 0
6	1 5868 7424	21	5033 8337 0
7	1 7138 2416	22	5436 5404 0
8	1 8509 3020	23	5871 4636 0
9	1 9990 0467	24	6341 1807 0
10	2 1589 2496	25	6848 4751 0
11	2 3316 3896	26	7396 3532 0
12	2 5181 7016	27	7988 0614 0
13	2 7196 2376	28	8627 1063 0
14	2 9371 9366	29	9317 2748 0
15	3 1721 6916	30	1006 2650 6

In this ſort you may gather all the Tables or Breuiats for any rate in the hundred, which I will here omit in this ſmall vollum, intending afterwards to publiſh this, and diuers

diuers other operations in my ſecond Edition of my Booke of Decimall Arithmatick ſhortly to come forth.

The vſe of theſe Breuiates and Tables, and of all others of like nature in working of queſtions of Intereſt and Annuities.

Rule 1.

To find what 1 pound due at any number of yeares is worth at the end of the terme?

Enter the Table of 10 pound in the hundred, and find in the left Margent the number of yeares, and from that number ſo found, cut off ſeuen figures, the anſwere is in pounds, primes, ſeconds, thirds, fourths, &c. for the anſwere to the queſtion demanded.

1. *Example.*

What is one pound put forth at intereſt compound, at 10 pound in the hundred worth, to be paid at the end of 18 yeares? Find the eighteenth number in the Breuiat, which is 5|5599173; from which cut off ſeuen figures to the right hand, and the anſwere is 5 pound, 11 ſhillings, 2 pence, 9.

Example.

l. 1.2.3.4.5.6.7
5|5 5 9 9 1 7 3 Makes 5 *l.* 11 *s.* 2 *d.* 1*q.*

2. *Example.*

What is 100 pound due at 7 yeares end worth to be paid at the end of the terme, at 10 in the hundred compound Intereſt? Find the ſeuenth number in the Table of 10 *l.* in the hundred, makes 19487171; to the which adde two Cyphers, becauſe 100 pound hath two Cyphers, and cut off ſeauen figures to the right hand, and the ſum is 194 pound, 87171 fifthes for the Anſwere.

l. 1.2.3.4.5
1 9 4|8 7 1 7 1 0 0, Or 194 *l.* 17 *s.* 5 *d.* almoſt.

3 *Example.*

What will 758 pound for 6 yeare make at 10 pound in the hundred compound Intereſt, to bee paid at the end of the terme? Finde the ſixth number in the Table of 10 pound in the hundred, which is 1771561 0; which

which multiply by 758, the money named in the queſtion, and the product, cutting off 7 figures to the right hand, makes 1342 pound, 16 ſhillings, 10 pence, *ob.* almoſt.

1.2.3.4.5.6.7
1771561 0
758

14172488 0
8857805 0
1240092 70

1342|8432380

Rule 2.

How to find what any yearely Annuitie will make to bee paid all at the end of the terme? Firſt, find the number of yeares of the annuitie giuen, and from the number anſwering, deduct a vnite in the firſt place to the left hand, and adde a Cypher to the laſt figure to the right hand, and cut off ſeuen figures to the right hand, and the anſwere is found.

1. Example.

1. *Example.*

What will 1 pound annuitie make, to be payd for at the end of the terme of 16 yeeres at 10 pound in the hundred compound intereſt? Find the ſixteenth number in the Table of 10 pound in the hundred, and ſubtract a vnite from the firſt figure to the left hand, adding a Cypher to the right hand, makes 359497290; From the which cut off 7 figures to the right hand, makes 35 pound, 18 ſhillings, 11 pence, 3 farthings.

l. 1. 2. 3. 4. 5. 6
35|9497290

2. *Example.*

What will 1000 pound annuitie yearely amounteth vnto to be all forborne vntill the end of the terme of 5 yeares at 10 pound in the hundred compound intereſt? Find the fifth number in the Table of 10 pound in the hundred, and ſubtract a vnite from the firſt figure, adding a Cypher in the laſt place, makes 61051000; then becauſe 1000 pound hath 3 Cyphers, adde 3 Cyphers, and cut

cut off ſeuen figures, makes 6105 pound, 2 ſhillings for the anſwere.

l. 1.2.3.4.5.6.7
6105|1000000

3. *Example.*

What will 142 pound annuitie make to be paid at the end of the terme of 10 yeares? Find the tenth number in the Breuiat of 10 pound in the hundred, and ſubtract a vnite in the firſt place, adding a Cypher to the laſt, makes 1593742 40; which multiply by 142 pound, the annuitie named, and from the product cut off ſeuen figures to the right hand, and the anſwere to the queſtion is 2263 pound, 2 ſhillings, 2 pence, 3 farthings.

l. 1.2.3.4.5.6.7
1593742 40
142

31874848 0
637496960
159374240

2263|1142080

3. *Rule.*

How to find what any ſumme of money due at the end of any number of yeares is worth in ready money, at 10 pound in the hundred compound intereſt. Enter the Table of 10 pound in the hundred with your number of yeares; and the numbers which doth anſwere in the Table is your Diuiſor; then adde ſeuen Cyphers to your ſumme of money giuen, to make your diuidend; then diuide your diuidend by your Diuiſor, and the quotient, adding more Cyphers, will be your anſwere in pounds, primes, ſeconds, thirds, &c.

1. *Example.*

What is 1000 pound due at 7 yeares end worth in ready money, at 10 pound in the hundred compound intereſt? Find the ſcuenth number in the Table of 10 pound in the hundred, which is 9487171, this is your Diuiſor. Then adde ſeuen Cyphers to 1000 pound, makes 10000000000; or adde more Cyphers, marking out your prime line in your diuidend, to find out how many figures your

your quotient will haue in whole numbers, and the reſt will bee primes, ſeconds and thirds; this is your diuidend, and then diuide by your diuiſor, makes 513 pound, 3 ſhillings, 2 pence.

1 5 8 2
1 1 3 2 5 0
3 0 8 1 2 5 1
1 5 4 2 7 7 9 3
1 6 6 4 1 4 5 9 7 9 5 *l. 1. 2. 3*
1 0 0 0 0 0 0 0 0 0 0 | 0 0 0 (5 1 3 | 1 5 8
1 9 4 8 7 1 7 1 1 1 1 1
1 9 4 8 7 1 7 7 7 7 7
1 9 4 8 7 1 1 1 1
1 9 4 8 7 1 1
1 9 4 8 7

Hauing found what 1000 pound due at 7 yeares end is worth in ready money, if you will find what 100 pound, or 10 pound, or 1 pound is worth in ready money; place your quotient in decimalls, and marke out your prime lines, cutting of one figure for 100 pound, 2 for 10 pound, or 3 for 1 pound, the anſwere is as followeth.

Example.

For 100 *l.*	For 10 *l.*	For 1 *l.*
l. 1.2.3.4	*l.* 1.2.3.4.5	1.2.3.4.5.6
51|3158	5|13158	513158

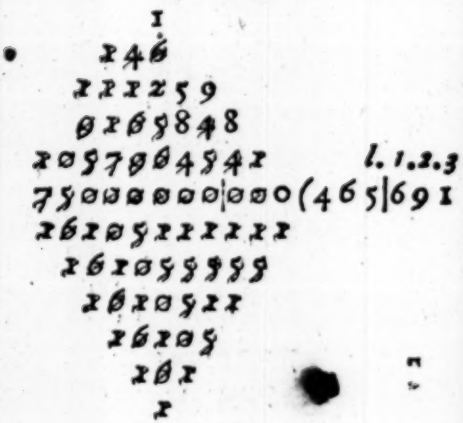
51 *l.* 6 *s.* 3 *d.* 3 *q.* | 5 *l.* 2 *s.* 7 *d.* 2 *q.* | 10 *s.* 3 *d.* 1 *q.*

2. *Example.*

What is 750 pound due at 5 yeeres end worth in ready money, at 10 pound in the hundred compound intereſt? Find the fifth number in the Table of 10 pound in the hundred, which is 16105100 for diuiſor; then place 10 Cyphers before your number giuen 750 pound, and marke out your prime line, and diuide by your Diuiſor, and the quotient will be 465 pound, 13 ſhillings 10 pence for the anſwere to the queſtion giuen.

Example.

Example.



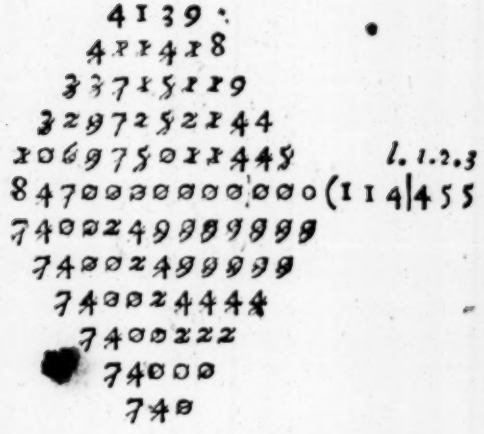
Makes 465 pound, 13 ſhillings, 10 pence.

3. *Example.*

What is 847 pound due at 21 yeares end worth in ready money, at 10 pound in the hundred compound intereſt? Find the 21 number in the Table of 10 pound in the hundred for Diuiſor, which is 74002499; then ſet 10 Cyphers to your numbers giuen, makes 8470000000000 for your diuedend; then diuide, and the quotient will be 144 *l.* 9 *s.* 1 *d.* 1:5 of 1 *d.* the anſwere.

Example.

Example.



Makes 114 *l.* 9 *s.* 1 *d.* 1:5 of a penny.

4 Rule.

How to find what any yearely Annuities for any number of yeares is worth in ready mony at 10 pound in the hundred compound interest. Enter the Table of 10 *l. per cent.* with your number of yeares giuen, and from the numbers found subtract a vnite in the first place, and place a Cypher in the last for your diuidend; which diuide by the number

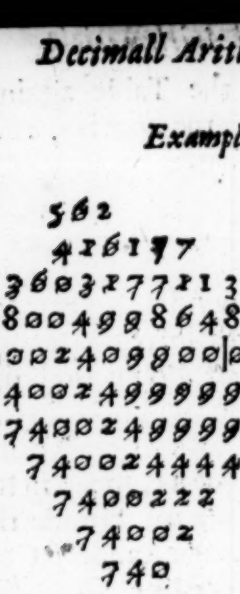
number found in the Table againſt your yeares giuen, and the quotient is the anſwere to the queſtion.

1. *Example.*

What is 100 pound *per annum* annuitie for 21 yeares worth in ready money at 10 pound in the hundred Compound intereſt? Looke in the Table of 10 pound in the hundred for 21 yeares, and ſubtract 1 vnite in the firſt place, and adde a Cypher in the laſt, makes 640024990: Diuide this by 74002499, the 21 number, adding Cyphers, and marking the prime line, and the quotient is 864 pound, 17 ſhillings, 4 pence, 2 farthings for the anſwere to the queſtion demanded.

Exam.

Example.



2. *Example.*

Hauing found what 100 pound annuitie will amount vnto, if you would know what 10 pound, or 1 pound annuitie will amount vnto, or 1000 pound in 21 yeares; place it in Decimalls, and cut off 1, 2, or adde 3 Cyphers to the laſt, or remoue 3 places, and you ſhall find your demand.

Example.

Example.

1000 *li.*	100 *li.*
1.2.3	*1.2.3*
8648|690	864|869
8648 *l.* 13 *s.* 9 *d.* 3:5	864 *l.* 17 *s.* 4 *d.* 3 *q.*

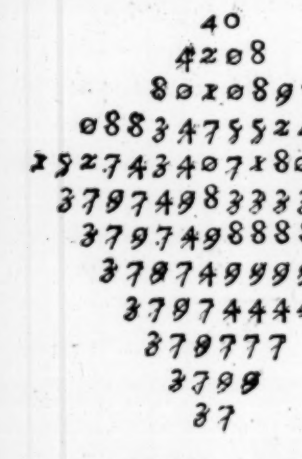
10 *l.*	1 *l.*
1.2.3.4	*1.2.3.4.5*
86|4869	8|64869
86 *l.* 9 *s.* 8 *d.* 3:4	8 *l.* 12 *s.* 11 *d.* 1:2

2. Example.

What is 546 pound yearely annuitie for 14 yeares worth in ready money, at tenne pound in the hundred compound intereſt?

Find the fourteenth number in the Breuiate of 10 pound in the hundred; from it ſubtract a Vnite in the firſt place, and adde a Cypher, makes 279749830; which multiply

multiply by 546, makes 1527434071800; which diuide by 37974983, the 14 number in the Breuiate, makes 4022 pound, 4 shillings, 2 pence, 3 farthings.



Makes 4022 *l.* 4 *s.* 2 *d.* 3:4

1. *Example.*

There is a Debt bought for 513 pound, 3 shillings, 2 pence ready money, which was due at 7 yeares end, now the question is, what the debt was at 10 pound in the hundred compound interest? Set your money paid

paid in Decimalls, makes 513|158; which multiply by 19487171, the number againſt 7 yeares, cutting off 10 figures, makes 999 pound, 999 thirds, wanting but one third of 1000 pound; wherefore I conclude, the debt was 1000 pound, which was due at 7 yeares end.

2 Example.

There was a Debt bought for 600 pound, which was due at 4 yeeres end, what was that debt at 10 pound in the hundred compound intereſt? Multiply 600 pound by the numbers againſt 4 yeares, which are 14641000 makes 878 pound, 4600000 ſeuenths, or in Coyne 878 pound, 9 ſhillings, 2 pence, 2:5 of 1 penny for the ſumme of that debt.

14641000
600

878|4600000

Makes 878 *l.* 9 *s.* 2 *d.* 2:5 of a penny.

I haue

I haue ſet no examples of the Table of 8 pound in the hundred, nor of no other rate, becauſe I intend ſhortly to ſpeake more at large of this ſubiect in another volume, if God pleaſe to giue mee time and health, in which I intend to ſpeake more at large of the Grounds, Reaſons and proofes of theſe kind of Operations, and here I will finiſh this ſmall Treatice of the ſecond Booke.

FINIS.